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Editor's Notebook

This issue of *Rural Development Perspectives* is a special one on the Great Plains. That area has long been considered a unique one with its own set of rural problems. Historically, these problems have centered around agriculture, and the region still depends on farming more than any other. As the postwar revolution in agricultural technology reduced the number of people needed on the farm, population has fallen in many counties and there has been a search for new economic opportunities and strategies. This issue looks at the Great Plains, its problems, and recent developments in the region's economy and in agricultural and rural policy that will affect its future. Thomas D. Rowley begins the issue with an overview of the Great Plains and the difficulties of fashioning development policies for an area that lacks many of the ingredients that have enabled many rural communities to make successful transitions from agricultural to more diversified economies.

As a naturally dry area of predominantly grasslands, the Great Plains was long thought of as the "Great American Desert," suitable at best for grazing cattle. When railroads made the Plains more accessible after the Civil War, farmers began arriving to cultivate the soil. Despite periodic droughts, the worst of which was the Dust Bowl of the 1930's, farmers learned to adapt agriculture to the dry conditions. David H. Harrington and Robert Dubman discuss recent developments in Plains agriculture and the effects of the 1996 farm legislation on agriculture and related industries. That law, which removes production controls and price supports, will probably cause farmers to plant more, increasing the demand for inputs and services. Whether or not this boosts farm income will depend largely on how much the new WTO and NAFTA treaties will increase demand for the region's grain, cattle, and cotton.

Richard Rathge and Paula Highman trace the long-term decline of population in the Great Plains. Counties with large cities have gained, but most rural areas have suffered decline, especially among young adults. John B. Cromartie's article discusses why the population losses of the 1980's have turned around for most counties in the mid-1990's. The most rural areas continue to lose population, but recent migration is associated less with rural to urban movement than with movement to high-amenity and good commuting areas.

Loss of population has affected industries well beyond agriculture. David A. McGranahan's article on manufacturing, based on a survey of manufacturers, confirms that, while labor is well-trained, an adequate supply is often hard to find where population has declined. Moreover, such areas are often perceived as unattractive to managers. Meat packing has accounted for much of the expansion of manufacturing in the Plains.

Retail/wholesale trade employment has also been greatly affected by declining population, according to the article by Donald J. Adamchak and others. Much of this effect was delayed until the 1980's, as many business owners held on until retirement or until competition from large chain stores became too intense.

Rick Reeder, Faqir Bagi, and Samuel Calhoun discuss Federal programs for the Great Plains and what proposed changes in defense, welfare, and other areas might mean for the region. Overall, the residents of the Plains receive more Federal funds per capita than the rest of the country, especially from agricultural, defense, and community and natural resource programs. Persistent poverty counties, and those where the predominant economic activity comes from agriculture or government, benefit the most.

Finally, Linda M. Ghelfi explains the importance of nonemployers in the Plains, especially for personal and business services and miscellaneous retailing. Many retail and service businesses are run solely by one person.

Feature Articles

Indicators

Thomas D. Rowley

Sustaining the Great Plains

The Great Plains—that huge tier of counties extending from Texas to Montana and North Dakota—continues its decades-long decline in population. Changes in agriculture together with a lack of economic alternatives and many of the amenities that drive rural population growth today are responsible. As a result, community services become more expensive to provide, the region's population ages, and future prosperity becomes even more difficult to achieve. Turning the situation around and making the Plains sustainable will require addressing economic, environmental, and social concerns.

A look at the map shows the problem (fig. 1). In spite of widespread population growth throughout rural America, the Plains continue to wane. In a period nicknamed the "rural rebound," the Plains have little bounce. Long-term trends in the Plains—population in nearly two-thirds of the region's 478 counties peaked prior to 1950—continue. Over 40 percent of the counties have seen continuous decline over the last 40 years and nonmetro counties in the region lost nearly 223,000 people (see Rathge and Highman, p. 19). The worst losses have come in the most rural, remote counties.

That is not to say that all areas of the Plains are declining. Over half of the counties have enjoyed some growth mixed in with decline over the last four decades, and 8 percent have consistently gained population. But most of the residential growth has been confined to metro counties.

Moreover, the Plains are not the only rural areas in need of assistance. Some rural areas suffer from decades-long poverty and the low levels of health care, education, and housing that go with it, while others grapple with wrenching changes in the economic and societal values that guide the use of the natural resources upon which they depend.

Each of these areas, in its own way, is a potential target for rural development assistance. And the recognition that "one size does not fit all," though not yet universal, is catching on. The needs of areas stricken with poverty are not the same as those of areas facing changes in the use of natural resources. Targeting—focusing specific assistance on specific areas with specific needs—is becoming one of the underlying strategies of Federal rural assistance (others being decentralizing decision-making and coordinating/collaborating). As evidence, witness the Empowerment Zone/Enterprise Community program targeted at those poverty areas and the President's Timber Adjustment Initiative aimed at helping timber-dependent communities.

As for the Plains, targeted attention is not new. Committees formed by Presidents Roosevelt in 1936 and Eisenhower in 1957 searched for ways to overcome the hardships faced by farmers trying to survive in the harsh, dry conditions of that region. Today the "Great Plains" issue is more complex, as illustrated by the work of a third committee—the Northern Great Plains Rural Development Commission appointed in 1996. In spite of all this attention, rural areas in the region continue to lose population.

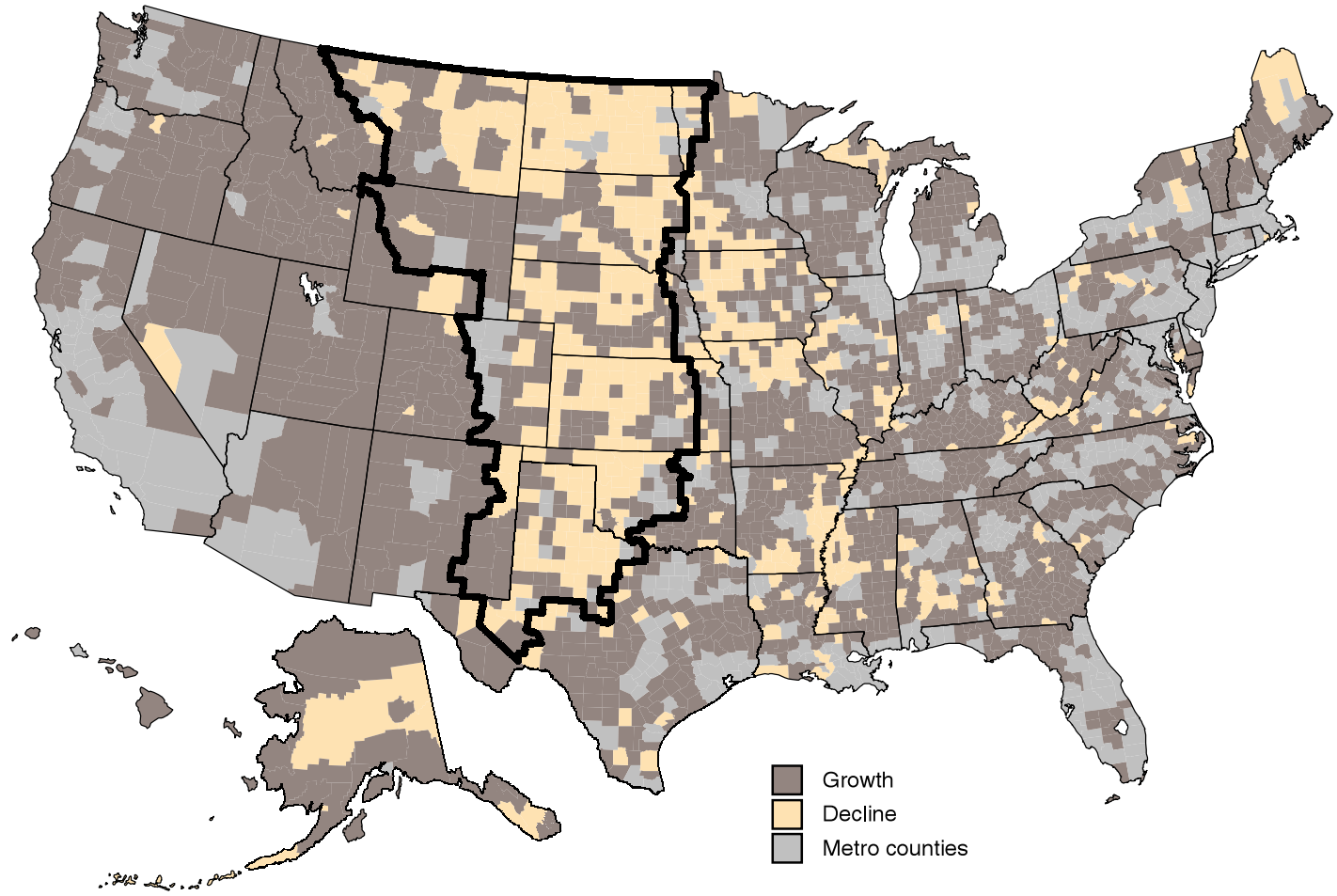
Why Is the Region Losing Population?

Population change is a function of migration and natural increase or decrease. Unfortunately for the Plains, many of its rural areas are losing on both dimensions. Not only are more people going than coming, but a population aged by the loss of young adults now has more deaths than births.

Outmigration. The one-word explanation for outmigration is jobs. Job opportunities in the Plains are limited.

Thomas D. Rowley is a former social science analyst in the Food and Rural Economics Division, ERS, USDA.

Figure 1
Nonmetro population change, 1990-96
Population decline in recent years has been disproportionately in the Great Plains



Source: Calculated by ERS using data from the Bureau of the Census.

Therefore, people—especially young adults—leave to find work.

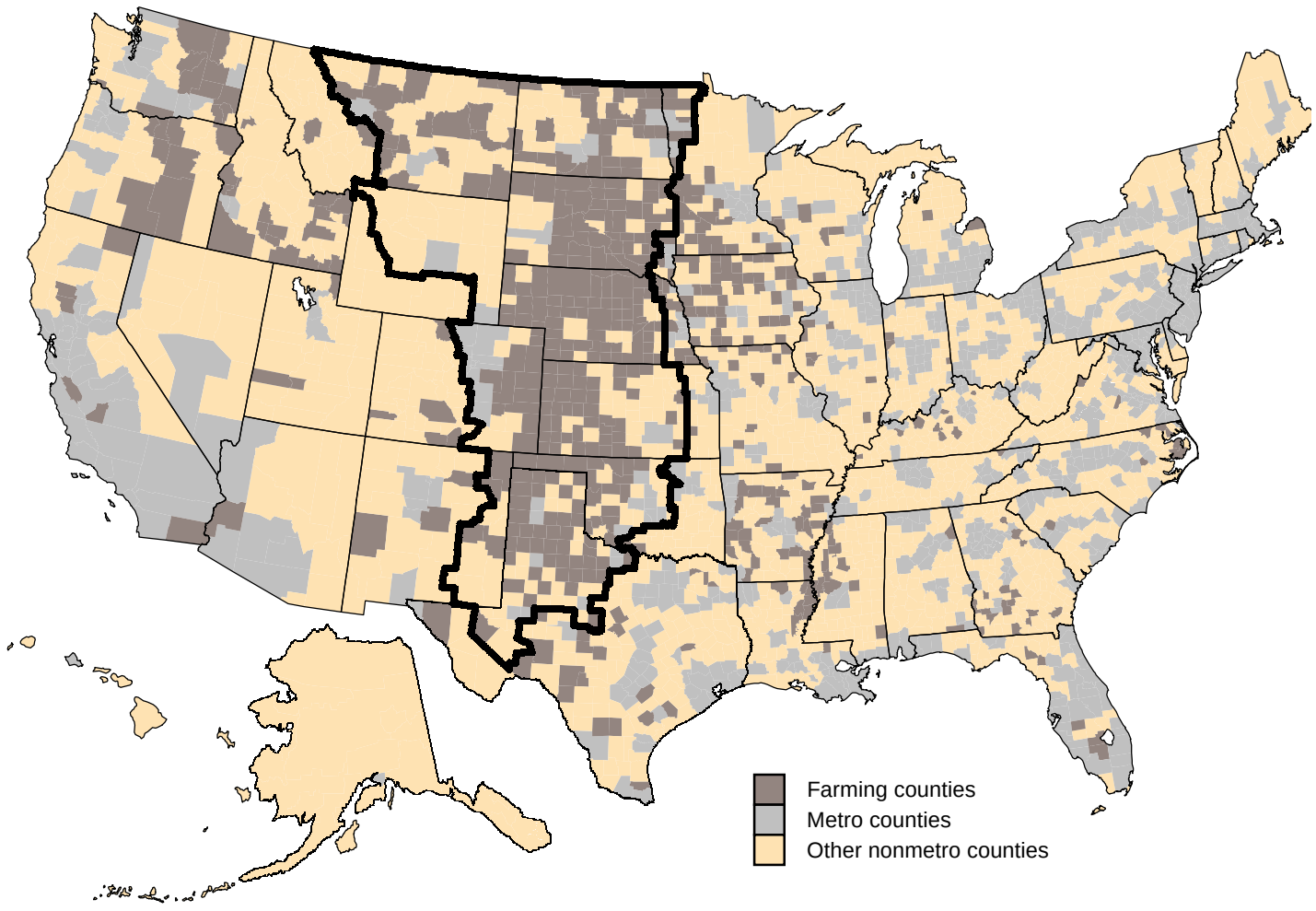
The lack of jobs is explained partly by the region's dependence upon agriculture (fig. 2). A strong link between agricultural employment and population decline has been observed by numerous researchers. In fact, Rathge and Highman (in this issue) found agricultural employment to be the most important predictor of population change in the Plains. According to their study, nearly two-thirds of the counties that lost population at rates exceeding 10 percent per decade for the last 40 years had over one-third of their total employment in agriculture. By comparison, no counties that had continuous growth and less than 10 percent of those that had mixed growth / decline had levels of agricultural employment that high. This link is due primarily to the reduction of demand for farm labor at the hands of improving technology.

Other researchers (see Cromartie, p. 27) have noted that downturns in the region's mining industries also contribute to outmigration. And still others (see Adamchak and others, p. 46) have concluded that population decreases in the rural Plains have led to reductions in retail and wholesale trade jobs. Those reductions in jobs, in turn, lead to further outmigration.

Inmigration. As for inmigration, surveys show that a large proportion of Americans would prefer to live in small towns and rural areas. And with improvements in transportation, information, and communication technology, Americans are increasingly able to act on that prefer-

Figure 2
Nonmetro farming-dependent counties, 1989*

Farm-dependent counties are centered in the Great Plains



*Counties with 20 percent or more labor and proprietor's income from farming, 1987-89 annualized average.
Source: Calculated by ERS using data from the Bureau of Economic Analysis.

ence. The preference seems to be based largely on the amenities that exist in many rural areas. These amenities range from the natural (mountains, water, mild climates) to the cultural ("small town lifestyles" and the perception of lower crime rates, friendlier attitudes, and higher quality of life). And while the Plains may have plenty of the latter, the former are decidedly missing. And rural counties with the former are growing the fastest.

The Results of Depopulation

Near-empty classrooms, boarded-up shops, and vacant houses are the visual images of depopulation. But with those images come a host of interrelated problems. As working-age and work-ready people leave the area, many of the people left behind are too old, underskilled, or undereducated to find work elsewhere. Consequently, they comprise a workforce that is relatively unattractive to a relocating business and relatively ill-equipped to start their own businesses.

At the same time, the per capita costs of providing services, such as education, utilities, and health care, to the remaining population and the per capita tax bite to pay for those services go up. Finally, the in-place investments or sunk costs (of infrastructure and housing stock, for example) can become stranded. Unable to pick up and move, this under-

used capital represents a loss to its owner—the taxpayer on public investments, business on capital equipment and real property, and the private citizen on real estate.

These factors can individually hinder attempts to revitalize a community; they can together present nearly insurmountable challenges.

What Can Be Done?

From a free-market point of view, the depopulation of the Plains is a perfectly rational response: People and capital leave the region in search of better returns to their labor and investments. Thus, not only is governmental intervention not required, it is inadvisable. If the market works, better for the country to leave it alone.

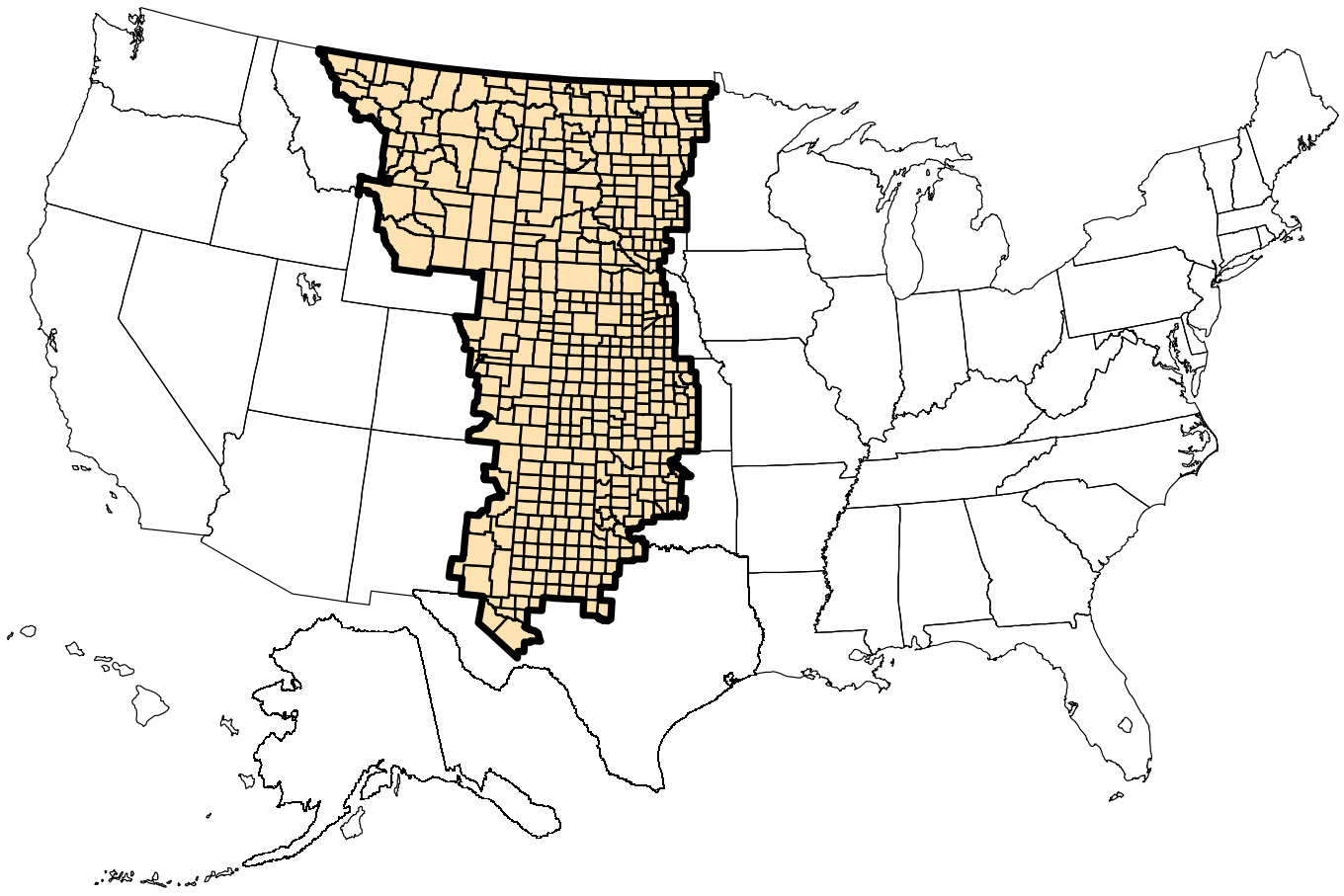
What Is the Great Plains?

The Great Plains is the continental slope of the west central United States, east of the Rocky Mountains. It is bounded on the north by Canada and on the west by the Rocky Mountain front. Its eastern and southern boundaries are more arbitrary, and various versions of these borders exist, depending on the premises used. In general, areas included in the Plains have lower and more erratic rainfall, sparser population, less timber, and less suitability for corn, cotton, or other crops without irrigation or periodic fallowing of land than do those to the east. The eastern boundary often lacks a sharp visible physical border. The region narrows to the south, in part abutting the Texas hill country. Most of the boundaries used here were taken from delineations shown in Donald L. Bogue and Calvin L. Beale, *Economic Areas of the United States*, Free Press, 1961. The region is generalized to county lines for research purposes. As here defined, it includes 477 counties (plus 1 county equivalent, a part of Yellowstone National Park in Montana), having about one-fifth of all U.S. land area outside of Alaska. This is larger than some other delineations.

Figure 3

The Great Plains

The Great Plains has 478 counties in 11 States



Source: Produced by ERS.

On the other hand, few would argue that a completely unfettered market does or should exist in the United States. In fact, one could argue that settlement of the Plains was induced by and has been maintained by subsidies (railroad land grants and agricultural commodity programs) that interfered with the workings of the market.

From a policy perspective, that particular debate is moot. Successful justification for Federal assistance to the Plains, or rural areas in general for that matter, is not likely to be cast in economic terms—"Is it necessary for national economic health or security?" That case is difficult to make and the evidence is less than convincing. Instead, the strongest justification seems to lie in the desires of the American people and their representatives to achieve some semblance of economic equity and to sustain some level of rurality and the amenities that accompany it. Precise definitions and quantities of equity and rurality, however, are hard to come by. Even harder to come by are clear and logical means to achieve them.

What precisely do we hope to achieve in the Plains and how will we achieve it? As with many things, the answer depends upon whom you ask. To many, stemming depopulation by creating jobs is not enough. Their goal is not simply to sustain rural communities in the Plains. Their goal is to sustain agricultural communities. The desire or perhaps even instinct to preserve one's homeland and one's way of life is understandably strong. And it is tempting to think that replacing lost agricultural jobs with new agricultural jobs will fix the problem. But given the long-term trends in agriculture, such as improved production technology, increasing competition, and changes in policy, the prospects for increases in agricultural employment are low—in the Plains and elsewhere. Nor is the potential for success increased greatly by turning to value-added agriculture and relocating food processing facilities to the farm. While agriculture and value-added agriculture will almost certainly play a part, sustaining rural communities in the Plains will require something more, something else.

Exactly how much more and exactly what else is still in question. Defining sustainable communities on the Plains, or anywhere else, is relatively new territory. Work on the subject is proceeding in a variety of places—the President's Council on Sustainable Development, USDA's Sustainable Development Council, the Joint Center on Sustainable Communities sponsored by the National Association of Counties and the National Conference of Mayors, to name a few. And obviously the most important work to be done in defining sustainable communities will be done in the communities themselves.

What, if anything, then, can be said at this time and from the national level about the path to sustainability for rural communities on the Plains? At least this: While economic development is only one of the three legs upon which sustainability stands (the other two being environmental protection and social equity), it is nonetheless an important part and one that we can measure. Thus, while we are moving to devise new sustainable criteria and indicators that encompass all three dimensions rather than simply aggregating criteria and indicators from each, it is nonetheless useful to look at the Plains through an economic development lens.

What will it take to make the Plains economically sustainable? In fact, the Plains are not very well-positioned to be economically sustainable or competitive in the years ahead. They lack many of the characteristics and assets of rural communities likely to succeed:

- Natural amenities that are drawing retirees, recreationists, and lone eagles (those entrepreneurs who can work anywhere there is a fax and modem),
- Connections to urban centers—the engines of global commerce,
- A diversified economy that can provide stability when one or another industrial sector lags, and
- Economies of scale (industrial and municipal) that reduce per unit costs and increase productivity.

Admittedly, nothing can be done about the first. Beautiful though the Plains may be to some, they lack the moderate climate, mountain scenery, and shorelines that draw large numbers of people. The other "milestones to economic sustainability," however, are important and costly if ignored. Therefore, efforts to promote sustainability will have to address them while taking into account their counterparts on the environmental and social dimensions.

For Further Reading . . .

Northern Great Plains Rural Development Commission, *Final Report,* Mar. 1997.

David Brown and Glen Fuguitt, "Residential Preferences and Population Distribution" (unpublished paper, 1997).

President's Council on Sustainable Development, Sustainable America: *A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future*, 1996.

David H. Harrington and Robert Dubman

Agriculture and New Agricultural Policies in the Great Plains

The Great Plains will be affected by the 1996 farm legislation in important ways. The transition to the new law could increase demands for farm inputs and services in the Great Plains by $1.2 to $1.4 billion per year (3.8 to 4.6 percent)—enough to make the difference between decline and growth for many farm-related sectors. The residual returns to the farm sector may decline under the 1996 law if demands for agricultural products continue to grow at their historical rates. But residual returns to the sector could increase if demands grow at slightly more than their historical rates, as is likely with the progressive implementation of the North American Free Trade Agreement and World Trade Organization pacts liberalizing trade in agricultural products. Increasing the rate of growth of farm product demands by an average of 1.4 percent per year over less than 4 years would restore longrun net returns to the favorable levels of the 1995 base year.

The Great Plains, stretching from Texas to the Canadian border and the 98th meridian to the Front Range, is the region of the United States that depends most on agriculture and agricultural programs. The Federal Agricultural Improvement and Reform Act of 1996 (1996 farm legislation) redesigned Federal agricultural programs so that they rely less on partial Federal control and production subsidization of many commodities and more on a "freedom-to-farm" philosophy and increased market orientation. How these changes in the 1996 law may affect the agriculture and farm-related sectors of this important agricultural region is a major concern for the continued development of the Great Plains economy. Using a model of the Great Plains agricultural economy, this article projects the impact and longer term adjustments resulting from the 1996 law on (1) the level and composition of farm incomes, (2) commodity production adjustments, and (3) demands for purchased inputs, hired labor, land rent, interest, and capital replacement investments. Quantitative estimates of each of these measures can help gauge the role of agriculture and agricultural policy in the future of the Great Plains economy, and indicate further adjustments in Great Plains agriculture.

David H. Harrington is a senior economist and Robert Dubman is an agricultural economist in the Farm Structure and Performance Branch of the Resource Economics Division, ERS, USDA.

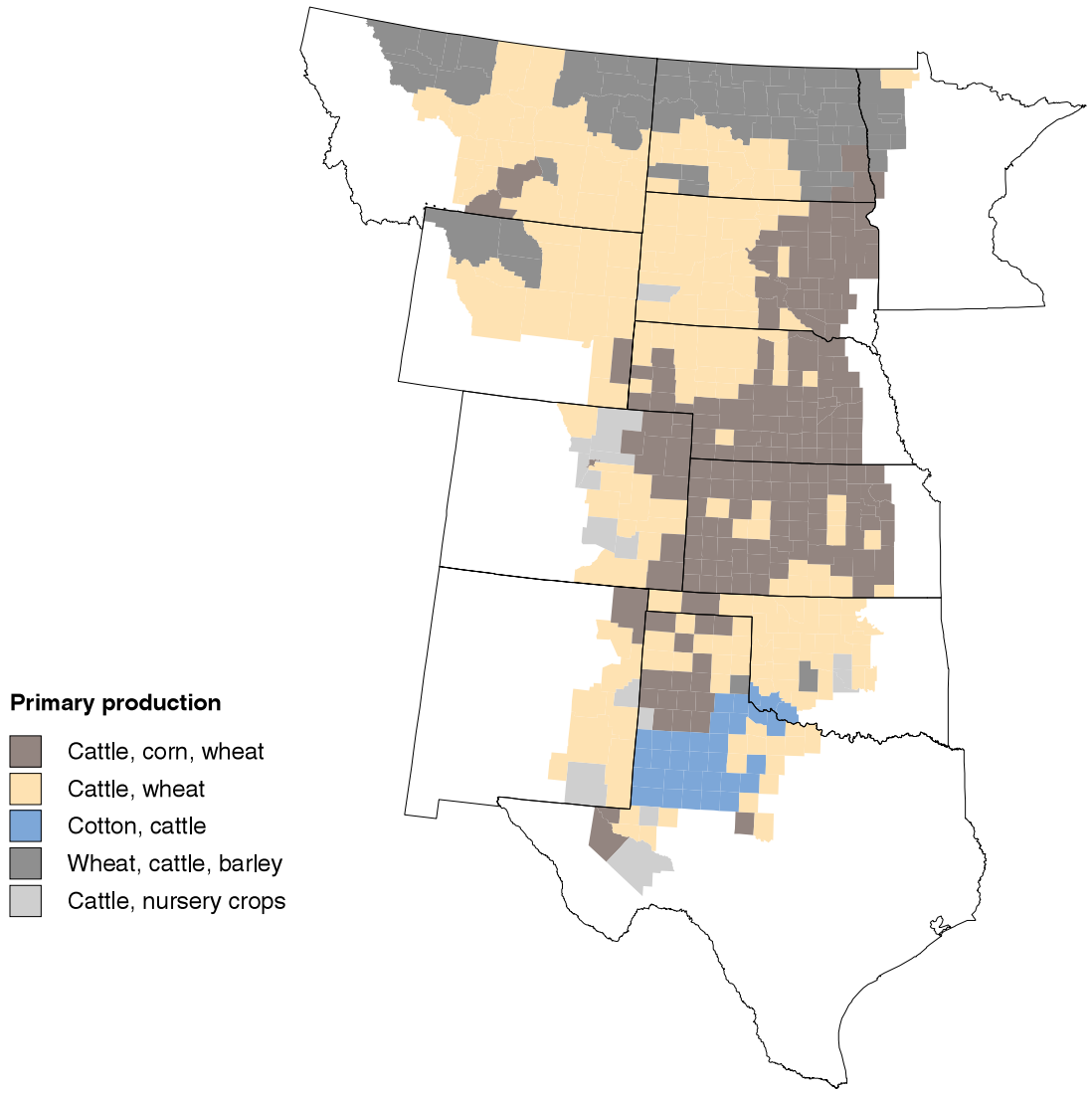
Great Plains Agriculture: Still "Home on the Range" but More Grain Crops

The Great Plains study region is delineated primarily along land resource and climatic zones to include the native mixed- and short-grass prairies. It is composed of 478 counties in 11 States. This region is the most agriculturally dependent in the United States; 58 percent of its counties are farm-dependent in the ERS county typology (where farming contributes at least 20 percent of labor and proprietors' income for the county; see fig. 2, p. 4). Fifty percent of all farm-dependent counties in the United States are in the Great Plains study area. The study area includes only 40 metro counties out of 478, or 8 percent. Many of these are on the western fringe of the study area, where the Great Plains meets the Front Range. In contrast, the rest of the United States has 795 metro counties out of 1,838, or 43 percent metro. For the seven States with the majority of their land area in the Great Plains region, agriculture makes up 5.5 percent of the gross domestic product (GDP) originating in the region—over three times as much as for the United States as a whole. State dependence on agriculture is highest in North

Figure 1

Farm production subregions of the Great Plains, 1992

The new Great Plains delineation includes 478 counties in 11 States; the five clusters are based on shares of sales of 20 commodities



Source: Calculated by USDA/Economic Research Service using data from the 1992 Census of Agriculture.

Dakota and South Dakota, at 10 percent of gross State product, and Nebraska, at over 8 percent of gross State product. The region leads in the production of beef and wheat. Beef production is primarily for the domestic market, but wheat is important in international trade, with 55 percent exported.

Historically, cattle ranching played a larger role in the Great Plains. It was the "Wild West," the home of cowboys, ranching, and open ranging. The rise of irrigated grain and cotton production, center-pivot systems and irrigation based on water from the Ogalala Aquifer, is a post-World War II phenomenon. As the nonfarm economy of the Great Plains has expanded, agricultural GDP has remained roughly constant, resulting in less dependence on agriculture than earlier in this century.

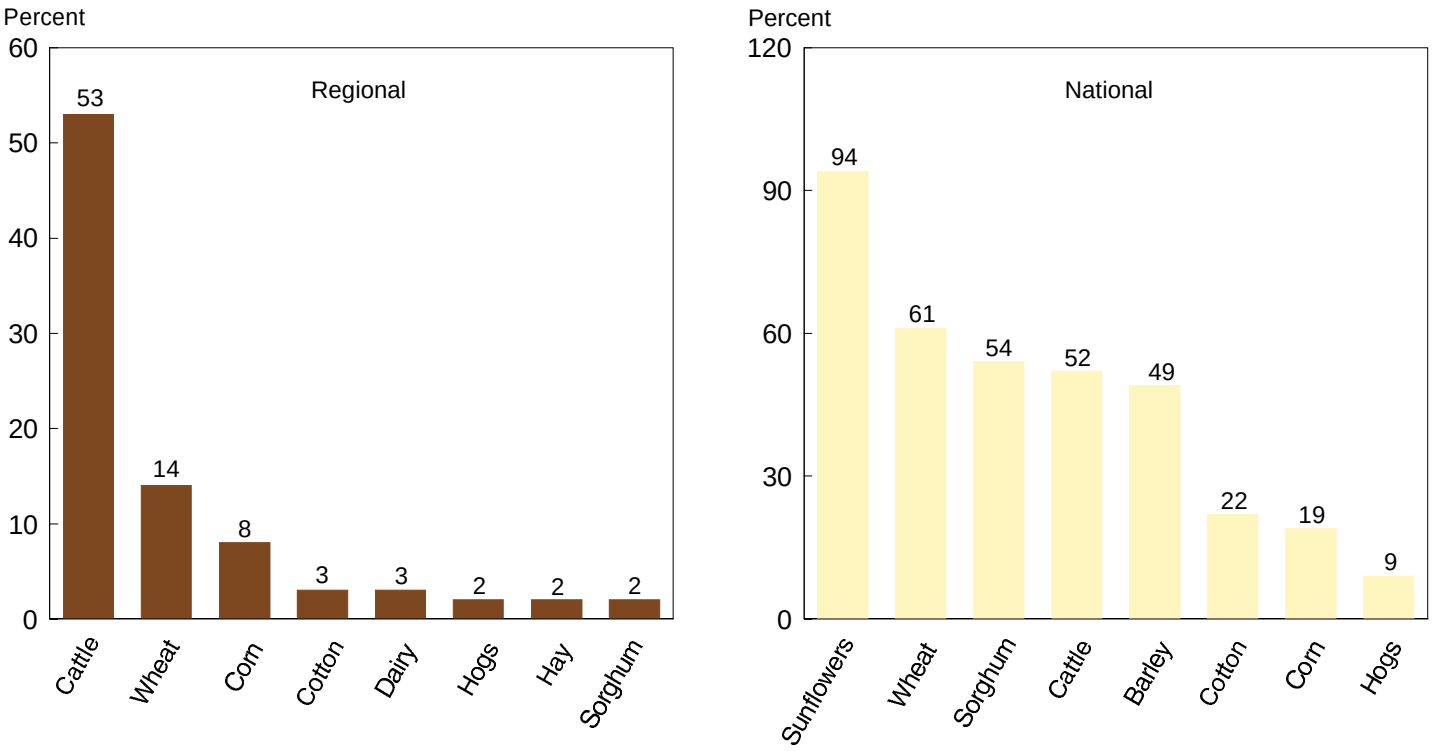
Agricultural development of the mixed-grass and short-grass native cover zones has led to five subregions where different mixes of commodities predominate. Cluster analysis of county-level commodity production data from the 1992 Census of Agriculture reveals these five dominant commodity areas (fig. 1):

- ***Cattle, Corn, Wheat.*** This subregion contains most of the irrigated corn acreage. Its eastern edges can be thought of as the western fringes of the Corn Belt.
- ***Cattle, Wheat***. The southern cattle-wheat areas of Kansas and Oklahoma and the northern range cattle-

Figure 2

Great Plains commodity production, 1995

Cattle, wheat, and corn lead in production; sunflowers, grain, and cattle lead in national shares



Source: Calculated by ERS using data from the 1995 Farm Costs and Returns Survey.

wheat areas of the Dakotas, Montana, and Wyoming are different climatic regions within this cluster.

- ***Cotton, Cattle.*** In the Texas High Plains and the Edwards Plateau, cotton and cattle are the predominant commodities.
- ***Wheat, Cattle, Barley.*** The northern tier of three to four counties along the Canadian border is an area where wheat and barley are raised in fallow rotations. Range cattle are the primary livestock commodity.
- ***Cattle, Nursery Crops.*** In certain counties bordering metro areas, nursery crops become important adjuncts to range cattle and cattle feeding enterprises.

There are 254,000 farms in the study region, operating 348 million acres. Cropland comprises 160 million acres, pastured cropland another 28 million acres, and rangeland a further 160 million acres, exclusive of grazing land rented by animal unit months (AUM land). Few commodities are well-adapted to growing in the Great Plains. As a percentage of the value of regional production, cattle and calves rank first, at 53 percent; wheat is second, at 14 percent; corn third at, 8 percent; and all other commodities are less than 3 percent of the regional value of production. Nevertheless, this region accounts for the largest share of U.S. production of many commodities that are adapted to the Great Plains climates. It produces 61 percent of the value of national wheat production (fig. 2). Great Plains production of cattle and calves accounts for 52 percent of U.S. production. Other national production shares of important commodities include sunflowers (94 percent), sorghum (54 percent), barley (49 percent), cotton, (22 percent), and corn (19 percent).

Thirty-four percent of direct government commodity payments go to farms in the Great Plains study region. Dependence on direct government payments reaches its highest level in the Great Plains. Over 30 percent of gross farm income originates from direct government payments in parts of the northern Great Plains (where wheat and barley production are important) and in the High Plains of Texas and New Mexico (where cotton, corn, and sorghum are important). Clearly, the effects of the 1996 law will be felt most strongly in these areas.

The 1996 Farm Legislation: More Flexible Production

Among many changes made in the 1996 law, those most affecting the study region are the following:

- Decoupling most production decisions from program payments. Under previous legislation, deficiency payments were made to participating farmers when prices for supported commodities (corn, grain sorghum, wheat, barley, oats, rice, and cotton) fell below target prices. Under the 1996 law, the effective prices for these commodities

dropped from target price levels to market price levels—typically 6 to 15 percent lower.

- Eliminating authority for the government to control the supply of these commodities through limiting acreage. Under previous legislation, producers typically had to "set aside" a portion of their historical base production acreage to qualify for payments. Set-aside requirements varied between 0 and 15 percent depending on the commodity and year. Both bases and set-asides were eliminated under the 1996 law.
- Setting fixed Federal income support payments to farmers by applying payment schedules that decline over the life of the law to the farmer's historical base production. Farmers and landlords can share these "production flexibility contract" (PFC) payments, regardless of what commodities they produce, if any.
- Phasing down dairy price supports from $10.35 per hundredweight to $9.90 in 1999. Thereafter, they will be eliminated and a loan-storage program at the equivalent of $9.90 per hundredweight will be instituted for butter, nonfat dry milk, and cheese. These loans are to help processors manage inventories and stabilize farm-level demand for milk. They will accrue interest and must be repaid as commodities are drawn out of storage.
- Reauthorizing the Conservation Reserve Program (CRP) for up to 36 million acres of environmentally fragile lands. Under both the 1996 law and the previous legislation, farmers could enter into long-term contracts paying them an annual rent for qualifying highly erodible lands put into conserving uses. The 1996 sign-up for the extended CRP maintained approximately the same number of acres (19.5 million acres in the study area) as previously in the CRP.

Other provisions of the 1996 law affecting trade may have an influence on international demands for Great Plains agricultural products. But the passage of the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO, formerly GATT) agreement will have more influence on the markets for agricultural products. Many additional details on the implementation of the above broad policies are specified in the law, but they do not alter the major thrusts outlined here.

Effects of the 1996 Farm Legislation on the Great Plains: Output Expands and Land Owners Gain

Several questions arise about the effects of the 1996 law. (1) How will production and input use in the Great Plains adjust to the changed relative prices for formerly supported commodities? (2) How will the level and composition of farm incomes change with the change from deficiency payments to production flexibility contract (PFC) payments? (3) How will these changes affect agriculture's demands for goods and services from the nonfarm economy?

The Great Plains acreage and production of commodities for the 1995 base year, forecasts for 1996 and 1997, and projections for 2000 under two alternative demand growth scenarios are shown in table 1. The levels of direct government payments to the Great Plains agricultural sector (middle of table 2) show that government transfers to the sector change little over the life of the law. The production flexibility contract payments follow the pattern mandated in the law and are slightly higher in the initial years than the deficiency payments that would have been paid under the previous legislation. The Conservation Reserve Program continues unchanged over the 7 years, with the 19.5 million acres enrolled in the Great Plains accounting for $545 million of direct payments per year.

Incomes Under the 1996 Legislation: Balanced on a Knife Edge of Demand Growth

Since net incomes of farms and farm families largely determine the consumption and investment demands of the farm sector, we concentrate our analysis primarily on these measures, and the contribution of demand growth to them. The demands of the agricultural sector for inputs from the rest of the Great Plains economy can be assessed by changes in the income and expense components of the farm sector, our second focus.

These results are regional aggregates and averages. In the agricultural sector, incomes and rates of return vary widely based on sizes of farms, productivity of resources, off-farm opportunities, and skills of the operator family. A low average income or rate of return does not imply that all farms or families get that return. Those with more favorable resources, skills, or market positions can still be earning favorable incomes. Those with less favorable resources, skills, or market positions will find their incomes squeezed even at higher average levels of return. The aggregates and averages show tendencies, trends, and relationships—not absolute levels applicable to all farms or families.

Farm Net Incomes Will Depend on Demand Growth and Land Rental Costs

The two measures of farm income we use are (1) shortrun net cash farm income and (2) longrun residual returns to the farm sector. Shortrun net cash income measures the net cash incomes of farms after paying for annual purchased inputs, hired labor, land rent, and farm overhead expenses. It does not include nonmoney income sources, such as changes in farm inventories, the value of home-consumed products, or the implicit rental value of farm dwellings. It does not cover replacement of capital items as they depreciate because these expenses can be postponed in the short run.

Longrun residual returns to the farm sector shift the focus from farm operators to the farm sector. The nonmoney income sources are included in residual returns to give a full accounting of the returns to all factors of production. Shifting the focus to the long run means that capital replacement costs (depreciation) must be covered in addition to the shortrun expense items. While land rental payments are an expense from the operator's point of view, these payments are part of the residual return to all assets used in the farm sector and are added back into the sector returns.

The 1996 levels of farm net income are not greatly changed from those of 1995 (table 2). Both were years of favorable prices, and revenues, including 1996 PFC payments, were only slightly larger than revenues would have been if the previous legislation had been continued. Aggregate shortrun net cash incomes for the Great Plains increased slightly less than 3 percent, from $5.65 billion to $5.80 billion. For the average Great Plains farm operator, this amounted to an increase from $22,188 to $22,809. The longrun residual returns to the sector increased nearly 14 percent.

In the 1997 forecast, net cash incomes of farm operators decline almost 15 percent while residual returns to the farm sector decline over 5 percent. These results reflect the increased production and lower prices for wheat, corn, and soybeans currently forecast for 1997.

For the longrun, normal-price scenario with average demand growth and average PFC payments of 1998 through 2002, shortrun net cash incomes of farm operators decline 29 percent while longrun residual returns to the sector decline 18 percent. On a per farm operator basis, this implies a very restricted average net cash farm income of $15,855 per year—significantly less than historical averages. With increased rates of demand growth for agricultural products, shortrun net cash incomes still decline nearly 11 percent while longrun residual returns to the sector remain constant. The reduction in net cash farm income with increased demand growth is equal to the increase in rent paid, implying that the increased land rents are coming at the expense of decreased returns to farm operators. In the future, rental contracts may be further renegotiated to restore the historical balance by returning more income to operators and less to landlords. These results show the agricultural sector's critical need for market growth. The difference between prosperity and recession for the farm sector rests on whether demand expands slightly faster than output growth, or the other way around.

Household Net Incomes May Decline, Even with Increased Demand Growth

Farm household incomes are measured by (1) shortrun household net cash-flow and (2) longrun household net income. Shortrun household net cash-flow starts with the shortrun net cash farm income of operators, adjusts for income paid to nonfarm households, adds the off-farm income of operators, and subtracts an estimate of their actual household living expenses. This creates a measure of the cash available to operator families in a given year to cover capital replacement, savings, and investment. It differs from the standard ERS measure of household income in that it does not allow for depreciation and it substracts estimated household living expenses. Because of multiple-operator farms, there are on average 1.1 operators per farm. Longrun household net income follows the methods used in the U.S. Department of Commerce's Current Population Survey and the ERS farm household income series. It starts with net cash farm business income, subtracts depreciation and income paid to other households, adds the household's farm-related earnings (wages paid to household members and income received from other farms), and adds the off-farm income of operators and household members. This creates a measure of longrun returns to farm families after paying for factors supplied from outside the household. This is a measure of the returns to the land, labor, and capital resources supplied by the farm household—whether used on or off the farm.

Shortrun household net cash-flow remained very stable in the transition from the previous legislation to the 1996 legislation, averaging over $16,000 per household in 1996, for total household cash-flow of nearly $4.5 billion for the Great Plains region. However, in the 1997 forecast, household net cash-flow declines 20 percent from the 1995 base, reflecting more normal household income prospects. Under the average-demand growth scenario for the remainder of the 1996 law, regional aggregate household net cash-flow drops 38 percent, from $4.4 billion to $2.7 billion. Household net cash-flows are depressed to an average of $9,650 per household. Such a low level would imply little cash available for capital replacement or investment, restricted current consumption, and very limited purchases of consumer durables. Even with increased demand growth to 2000, shortrun household net cash-flows remain depressed 14 percent below their 1995 levels.

1996 is a more favorable year than the 1995 base year in levels of longrun household net income. Longrun household net income increases under the 1996 law because it makes larger direct payments to the agricultural sector in the early years than would have been paid under the previous legislation. The forecast for 1997 shows longrun household net income dropping 7 percent to levels less

Table 1

Commodity production adjustments: Great Plains, forecast 1996 and 1997, and projected 2000 with average and increased demand growth

Commodity production generally increased in response to higher prices and reduced set-aside

Item	Base 1995	Under 1996 law			
		Forecast 1996	Change from 1995	Forecast 1997	Change from 1995
	Million acres		Percent	Million acres	Percent
Commodity acreage:					
Corn	11.14	12.10	8.62	11.55	3.68
Soybeans	5.02	5.42	7.97	5.63	12.15
Wheat	43.67	45.91	5.13	43.81	.32
Barley	3.88	4.52	16.49	4.24	9.28
Oats	.30	.46	53.33	0.71	136.67
Sorghum	5.21	5.88	12.86	5.53	6.14
Cotton	4.55	4.10	-9.89	3.71	-18.46
Sugar beets	.54	.54	0	.55	1.85
Potatoes	.04	.04	0	.07	75.00
Dry beans	.84	.84	0	.84	0
Sunflower	2.32	2.34	.86	3.19	37.50
Canola	.50	.51	2.00	.36	-28.00
Hay	23.81	23.98	.71	18.39	-22.76
Crops NEC	3.11	3.11	0	3.15	1.29
Fallow	32.32	32.53	.65	33.19	2.69
Set-aside acreage	5.01	0	-100.00	0	-100.00
CRP land	19.56	19.56	0	19.56	0
Total land in crops	161.82	161.84	.01	154.48	-4.54
Pasture	26.20	26.20	0	33.52	27.94
Range	160.00	160.00	0	160.00	0
		Million head			
Livestock production:					
Cow-calf	23.57	23.40	-.72	23.37	-.85
		Million hundredweight			
Fed beef	194.70	193.22	-.76	193.03	-.86
Hogs	21.53	21.20	-1.53	21.52	-.05
Dairy	83.84	81.82	-2.41	83.11	-.87
		Million dollars			
Sheep, lambs, wool	315.75	313.95	-.57	282.04	-10.68
Livestock NEC	246.33	246.31	-.01	246.31	-.01

See notes at end of table.

—Continued

buoyant than those of 1995 and 1996. The average-demand growth scenario for 2000 shows longrun household net income depressed by nearly 14 percent, while the increased growth scenario shows a reduction of 11 percent from the 1995 base. These levels continue to show that farm household net incomes will be somewhat squeezed by the increased land rental payments landlords have achieved under the 1996 law.

Income available for household living expenses is less than off-farm income sources, implying that, on average, the off-farm income sources are providing not only the cash living needs of the household but also a cash infusion to the farm business. The cash infusions to the farm business from off-farm sources increase when production or market conditions are unfavorable and decrease when they are favorable.

Table 1

Commodity production adjustments: Great Plains, forecast 1996 and 1997, and projected 2000 with average and increased demand growth—Continued

Mix of commodities produced returns to historical patterns under average or increased demand growth

Item	Base 1995	Under 1996 law			
		Projected 2000 with average demand growth	Change from 1995	Projected 2000 with increased demand growth	Change from 1995
	Million acres		Percent	Million acres	Percent
Commodity acreage:					
Corn	11.14	10.93	-1.89	11.23	.81
Soybeans	5.02	5.22	3.98	5.22	3.98
Wheat	43.67	45.54	4.28	45.57	4.35
Barley	3.88	4.15	6.96	4.09	5.41
Oats	.30	.50	66.33	.40	33.33
Sorghum	5.21	5.38	3.26	5.38	3.26
Cotton	4.55	4.04	-11.21	4.78	5.05
Sugar beets	.54	.55	.93	.55	1.85
Potatoes	.04	.05	12.50	.05	25.00
Dry beans	.84	.84	0	.84	0
Sunflower	2.32	2.38	2.59	2.38	2.59
Canola	.50	.55	9.20	.55	10.00
Hay	23.81	25.21	5.88	25.21	5.88
Crops NEC	3.11	3.14	.96	3.14	.96
Fallow	32.32	33.79	4.55	32.88	1.73
Set-aside acreage	5.01	0	-100.00	0	-100.00
CRP land	19.56	19.56	0	19.56	0
Total land in crops	161.82	161.82	0	161.83	0
Pasture	26.20	0	26.20	0	
Range	160.00	0	160.00	0	
		Million head			
Livestock production:					
Cow-calf	23.57	23.69	.51	23.70	.55
		Million hundredweight			
Fed beef	194.70	195.71	.52	195.73	.53
Hogs	21.53	21.58	.23	21.58	.23
Dairy	3.84	84.63	.94	84.65	.97
		Million dollars			
Sheep, lambs, wool	315.75	317.17	.45	316.32	.18
Livestock NEC	246.33	246.31	-.01	200.69	-18.53

NEC = Not elsewhere classified.

Source: Calculated by ERS using data from the 1995 Farm Costs and Returns Survey.

Input Usage: The Law Will Increase Demands for Goods and Services

Regional expenditures for inputs indicate the changes in demands for agricultural inputs entailed in the adjustments to the 1996 law. The aggregate change in all agricultural inputs and services is an increase of $1.2 to $1.4 billion, or 3.8 to 4.6 percent, for the region. Many of the expenditure components appear to change relatively little over the course of the law (1 to 3 percent) because the aggregate level of input use changes relatively little as farms substitute one commodity for another to adjust to the changed relative prices. Great Plains farm gross revenue would decrease only 0.75 percent by 2000 under the average growth scenario and would increase only 2.7 percent under the increased growth scenario. Nevertheless, the aggregate change represents a significant addition to

Table 2

Great Plains adjustments to the 1996 farm law: Income and input usage

1996 continued favorable conditions of 1995; 1997 incomes declined despite increased input use

Item	Base 1995	Under 1996 law			
		1996 actual	Change from 1995	1997 forecast	Change from 1995
Farm net income measures:					
Shortrun net cash farm income	$5,648M	$5,805M	2.78%	$4,807M	-14.89%
Average per farm	$22,188	$22,809	na	$18,884	na
Longrun sector residual returns	$5,486M	$6,239M	13.73%	$5,188M	-5.43%
Average per farm	$21,552	$24,510	na	$20,381	na
Household net income measures:					
Shortrun household net cash-flow	$4,372M	$4,485M	2.58%	$3,500	-19.95%
Average per operator household	$15,648	$16,052	na	$12,527	na
Longrun household net income	$10,494M	$10,854M	3.43%	$9,809M	-6.53%
Average per operator household	$37,559	$38,848	na	$35,107	na
Direct government payments:					
Total direct payments	$1,864M	$2,057M	8.62%	$1,994M	5.82%
Deficiency/PFC payments	$1,319	$1,512	11.40%	$1,449	7.70%
Average per farm	$5,182	$5,953	na	$5,705	na
CRP payments	$545M	$545M	0%	$545M	0%
Average per farm	2,142	2,147	na	2,147	na
Expense components:					
Hired labor	$1,500M	$1,507M	.47%	$1,480M	-1.33%
Average per farm	$5,893	$5,920	na	$5,814	na
Purchased variable inputs	$16,784M	$17,040	1.53%	$17,044M	1.55%
Average per farm	$65,936	$66,942	na	$66,957	na
Capital replacement purchases	$2,767M	$2,852M	3.07%	$2,905M	4.99%
Average per farm	$10,870	$11,204	na	$11,412	na
Rent paid	$1,835M	$2,516M	37.11%	$2,516M	37.11%
Average per farm	$7,209	$9,884	na	$9,884	na
Fixed expenses paid	$5,437M	$5,506M	1.27%	$5,677M	3.11%
Average per farm	$21,359	$21,630	na	$22,302	na
Interest on borrowed capital	$1,991M	$2,042M	2.56%	$2,084M	4.67%
Average per farm	$7,822	$8,039	na	$8,187	na
Total: All expense components	$30,314M	$31,463M	na	$31,706M	na
Absolute change from base	na	$1,149M	3.79%	$1,392M	4.59%
Off-farm income	$7,705M	$7,640M	-.84%	$7,658M	-.61%
Average per operator household	$27,577	$27,344	na	$27,409	na

See notes at end of table.

—Continued

demands for agricultural inputs as a result of the 1996 law. The projected increases in demand for agricultural inputs and services counteract the declines of the last 10 years in total input use in Great Plains agriculture and can spell the difference between decline and growth in many agricultural input supplying sectors.

One expenditure category that increased significantly over the course of the law is land rent (37 percent). Land rent increases because the increased share of cash PFC payments won by landlords is included in this expenditure category. Landlords apparently have been more successful in capturing a greater proportion of the cash PFC payments than they had been in capturing the less concrete returns under the target price and deficiency payment system of the previous legislation.

Hired Labor. Hired labor demands increased slightly in 1996 in response to reduced set-aside acres and increased production of all crops, except cotton. In 1997, hired labor demand is forecast to decline slightly from its 1996 levels, due to less labor-intensive crops being substituted for more labor-intensive crops as their relative prices change. In 2000, hired labor demands again increase by 1.5 to 1.7 percent. A 1-percent increase in hired labor rep-

Table 2

Great Plains adjustments to the 1996 farm law: Income and input usage—Continued

Incomes fall significantly under average demand growth

Item	Under previous legislation	Under 1996 law			
		Projected 2000 with average demand growth		Projected 2000 with increased demand growth	
	Base 1995	Level	Change from 1995	Level	Change from 1995
Farm net income measures:					
Shortrun net cash farm income	$5,648M	$4,036M	-28.54%	$5,043M	-10.71%
Average per farm	$22,188	$15,855	na	$19,811	na
Longrun sector residual returns	$5,486M	$4,488M	-18.18%	$5,486M	0%
Average per farm	$21,552	$24,510	na	$20,381	
Household net income measures:					
Shortrun household net cash-flow	$4,372M	$2,695M	-38.36%	$3,752M	-14.18%
Average per operator household	$15,648	$9,646	na	$13,429	na
Longrun household net income	$10,494M	$9,077M	-13.50%	$9,325M	-11.14%
Average per operator household	$37,559	$32,487	na	$33,375	na
Direct government payments:					
Total direct payments	$1,864M	$1,864M	0%	$1,864M	0%
Deficiency/PFC payments	$1,319M	$1,319M	0%	$1,319M	0%
Average per farm	$5,182	$5,193	na	$5,193	na
CRP payments	$545M	$545M	0%	$545M	0%
Average per farm	$2,142	$2,142	na	$2,142	na
Expense components:					
Hired labor	$1,500M	$1,523M	1.53%	$1,525M	1.67%
Average per farm	$5,893	$5,983	na	$5,991	na
Purchased variable inputs	$16,784M	$16,984M	1.19%	$17,062M	1.66%
Average per farm	$65,936	$66,722	na	$67,028	na
Capital replacement purchases	$2,767M	$2,835M	2.46%	$2,844M	2.78%
Average per farm	$10,870	$11,137	na	$11,173	na
Rent paid	$1,835M	$2,516M	37.11%	$2,516M	37.11%
Average per farm	$7,209	$9,884	na	$9,884	na
Fixed expenses paid	$5,437M	$5,533M	1.77%	$5,677M	1.78%
Average per farm	$21,359	$21,736	na	$21,740	na
Interest on borrowed capital	$1,991M	$2,084M	4.67%	$2,084M	4.67%
Average per farm	$7,822	$8,187	na	$8,187	na
Total: All expense components	$30,314M	$31,475M	na	$31,565M	na
Absolute change from base	$1,161M	na	3.83%	$1,251M	4.13%
Off-farm income	$7,705M	$7,606M	-1.28%	$6,853M	-11.06%
Average per operator household	$27,577	$27,344	na	$27,409	na

na = Not applicable.

Source: Calculated by ERS using data from the 1995 Farm Costs and Returns Survey.

resents a $17.6-million addition to the farm labor demands in the Great Plains.

Annual Purchased Inputs. The largest component of expenditures is purchases of annual production inputs. These amount to around $17 billion or $66,000 per farm each year. A 1-percent increase in purchased inputs represents $170 million per year to the region. Under each scenario, purchased inputs increase by 1.2 to 1.7 percent, due to using formerly set-aside acres and substituting more input-intensive crops for less input-intensive crops.

Capital Replacement Purchases. Replacement of capital items to offset annual depreciation of machinery and equipment represents an additional $2.8 to $2.9 billion to the Great Plains economy and a cost of $11,000 dollars to the average farm. Capital replacement purchases increase 3.1 to 5.0 percent in the transition to the 1996 law.

Analytic Methods

This analysis employs new extensions of techniques for modeling economic adjustments and supply response, building upon positive mathematical programming methods. In simplified form, the analyst constructs a model of the production, onfarm use, and demand for each agricultural product in the study region to produce a regional income and expenditure statement. Survey data from ERS's Farm Costs and Returns Surveys for 1995 provide a description of the farms and their production of various commodities. ERS's cost of production accounting systems are used to specify the 1995 average costs and input usage for each of these commodities. The resulting model is calibrated to accurately reproduce the base year production, demands, prices, and incomes. It is then solved for scenarios representing the changes in prices and policies. All prices and quantities and incomes and expenditures adjust simultaneously to a new solution. Comparing model results and operating statements of the various scenarios to the base year shows how the agricultural economy would likely adjust production, input use, prices, incomes, and expenditures.

Model Validation: Tracking USDA Forecasts

Calibration of the model to the 1995 base year under the previous legislation is accurate to a value-weighted mean error of 0.87 percent. Major commodities, such as cow-calf, fed beef, wheat, corn, and soybeans have calibration errors of less than 2 percent. Calibration errors among minor commodities range to over 50 percent, but the total land involved in these errors is less than a million acres. Hay production has a calibration error of nearly 23 percent, resulting from using slightly more land in hay production for greater than actual regional exports of hay.

We conducted three validation tests on the model: (1) forecasting the 1996 actual commodity adjustments of the region under the 1996 law, (2) tracking the 1997 USDA forecast, and (3) tracking the 2000 USDA baseline projection. The model performed well on all three tests, giving value-weighted mean forecast errors of 0.41 percent, 1.10 percent, and -1.44 percent. Forecast errors for major commodities remained below 4 percent and minor commodity errors centered near zero over all validation tests for each minor commodity for which a USDA forecast was available. This forecasting performance matches or exceeds the reliability of national econometric forecasting models, such as USDA's FAPSIM Model, or the University of Missouri's FAPRI Model.

Replacement of capital items is usually a periodic event, undertaken when revenues are favorable and suspended when revenues are unfavorable. Because of this, expenditures for capital replacement are highly volatile, being severely depressed in unfavorable times and buoyant in favorable times.

Land Rent. Land rental payments, in cash and shares of crops, total $1.8 billion or $7,200 per farm in the base year. With the shift to cash PFC payments, landlords have renegotiated rental contracts to increase their share of the PFC payments. Land rent paid increased by more than 37 percent with the introduction of PFC payments in the 1996 law. Part of this may be attributable to the fact that both 1996 and forecast 1997 were relatively favorable years. By 2000 under both the average growth and the increased demand growth scenarios, the increase in land rent comes at the expense of diminished operator net cash income. Thus, there is likely to be another round of renegotiating of rental contracts to reduce them to nearer the historic split of income between landlords and operators.

Fixed Expenses Paid. Fixed farm overhead expenses, such as insurance, taxes, general farm supplies, repairs, and services, represent another $5.5-billion demand for goods and services by the farm sector, or $21,000 to $22,000 for the average farm (table 2). Demands for goods and services in the fixed-expense-category increase 1.3 to 3.1 percent under the 1996 law.

Interest on Borrowed Capital. Interest on borrowed capital amounts to approximately $1.9 billion in the 1995 base year, or $7,800 for the average farm. This level of interest cost is consistent with about $100,000 of debt per farm, and a debt/asset ratio of 18 percent—approximately the average for the Great Plains. The transition to the 1996 law increases interest paid by 2.6 to 4.7 percent.

Changes in demand for some expenditure components are not strong in the adjustment to the 1996 law. However, the law was enacted at a time when only a relatively few acres were idled in the Great Plains—5 million acres. Had the acreage of land idled been large in 1995, the effects of the law on input demand would have been much stronger. Policies restricting land use (such as set asides and the CRP) restrict the throughput of the sector and significantly affect the demands for goods and services by the farm sector.

Off-Farm Incomes Decline Slightly; Household Consumption Expenditures Squeezed

Off-farm incomes decline slightly because more operator and household labor is needed to operate the 5 million acres of cropland set aside under previous legislation but freed up for production under the 1996 law. The unresponsiveness of off-farm incomes to the 1996 law indicates that taking additional off-farm employment that is competitive with fully operating existing farm resources is generally uneconomic. In reality, off-farm employment would probably respond positively to the squeezed household incomes, but only when it could do so without diminishing the operator and household labor committed to farming.

Table 3

Demand shifts necessary to restore longrun residual returns

Less than 4 years at a high-demand growth rate will restore the favorable conditions of 1995

Item	Under 1996 law		
	Demand shift needed	1980-94 growth rate	Time needed at doubled growth rate
	Percent		Years
Commodity:			
Corn	5.25	2.00	2.58
Soybeans	3.93	2.32	1.70
Wheat	8.24	2.00	4.00
Barley	5.26	2.00	2.59
Oats	5.26	2.00	2.59
Sorghum	5.26	2.00	2.59
Cotton	6.44	3.93	1.62
Sugar beets	.44	1.72	.26
Potatoes	-.45	2.86	na
Dry beans	1.00	2.32	.43
Sunflower	2.73	2.32	1.16
Canola	5.74	2.32	2.43
Hay	9.24	2.00	4.46
Crops NEC	.42	2.25	.20
Livestock production:			
Fed beef (million hundredweight)	1.39	.38	3.64
Hogs (million hundredweight)	.55	.38	1.45
Dairy (million hundredweight)	2.02	1.16	.74
Sheep, lambs, wool (million dollars)	.76	.38	2.00
Livestock NEC (million dollars)	-1.26	1.38	na
Value-weighted demand shift (percent)	3.23	na	na
Average demand growth, 1980-94	na	1.38	na
Value-weighted average years to attain growth	na	na	3.26

na = Not applicable.
NEC = Not elsewhere classified.
Source: Calculated by ERS using data from the 1995 Farm Costs and Returns Survey.

Income available for household consumption, investment, and savings (the income side of family net cash-flow) is severely squeezed if anticipated demand growth to 2000 does not materialize. Even under the increased growth scenario, the income side of family net cash-flow declines by the amount of increased land rental payments. Farm families typically increase consumption expenditures in favorable times and cut back considerably in unfavorable times, making sales of household consumption goods quite responsive to changes in income available for household consumption.

How Much Growth Is Needed To Offset Declining Net Returns?

Over recent years, effective demands for agricultural commodities have tended to increase at average rates near 1.5 percent per year. However, with the concluding of the NAFTA and WTO trade agreements, the 1996 law was predicated on increased demand growth due to greater access to international markets. The question arises: How much demand growth would be necessary to compensate for the policy changes in the 1996 law? Table 3 shows the percentage demand shifts needed, by commodity, to restore the 1995 base level of longrun residual returns to the sector at historic relative prices. At these relative prices, no commodity or subregion is at an advantage or disadvantage relative to the base year. To compensate for the shift from the previous legislation to the 1996 law, demands for major crops would have to increase by amounts ranging from 9 percent (hay), to 8 percent (wheat), to 6 percent (cotton). Corn, sorghum, barley, and oats would have to increase by 5 percent; and demands for other crops would have to increase less than 5 percent. Livestock commodities would need much smaller demand shifts—1.4 percent for beef, 0.6 percent for hogs, 2.0 percent for dairy, and 0.76 percent for sheep, lambs, and wool. The value-weighted average growth rate needed is 3.23 percent (table 3).

Complicating the needed increase in demand is the fact that agricultural output has historically grown at an average rate of 1.4 percent per year, due to productivity

growth. Increased productivity offsets the increased demand, historically requiring almost all of the annual growth in demand just to keep residual net returns to the farm sector from declining. Reaching the needed net demand growth for each commodity, after compensating for its historic output growth, would require doubling the rate of demand growth for each commodity for an average of 3.26 years. Hay, wheat, and beef would require longer periods; and grains and oilseeds would require shorter periods.

Conclusions

With the passage of the 1996 farm law, traditional methods of supporting agricultural prices and incomes continued their transition towards more market orientation and less government control of commodity production. The law was passed at a time when agricultural prices and incomes were relatively favorable and prospects for growth in demand for agricultural commodities were buoyant because new international trade agreements, WTO and NAFTA, were being implemented. The effects of the 1996 law on the Great Plains agricultural economy will be to increase demands for farm inputs and services by $1.2 to $1.4 billion per year (3.8 to 4.6 percent) as the land formerly idled to comply with production control programs comes back into production and farmers adjust their enterprise mixes to the changed relative prices for formerly supported commodities.

With the change from target prices and deficiency payments under the previous legislation to fixed cash production flexibility contract payments under the 1996 law, land owners have been successful in obtaining a larger share of government payments. The increase in rental payments seems to have come at the expense of decreased returns to farm operators

How the change in policy will affect farm incomes and farm household incomes crucially depends on the rate of growth of markets. If demands for agricultural commodities grow at their historical rates, farm and farm household incomes will decline by 28 to 38 percent over the duration of the law. If markets grow at double their historical rates, as appears likely with the new international trade agreements, residual returns to the farm sector can reach the relatively favorable levels of the 1995 base year in less than 4 years. Such a doubling of the historical growth rates for commodity demands requires a weighted average increase in growth rates of only 1.4 percentage points per year—well within the annual fluctuations in demand due to weather and market conditions. However, unless land rental contracts are further renegotiated to restore a more traditional split of income between operators and landlords, net farm income and net household incomes will likely remain below 1995 levels.

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Richard Rathge and Paula Highman

Population Change in the Great Plains
A History of Prolonged Decline

Agricultural restructuring has dramatically redistributed population in the Great Plains. The region's few counties with large urban centers have grown while the majority of counties, mostly rural, have declined. Prolonged outmigration of young families has distorted the age distribution in many counties and further perpetuated population loss by creating high proportions of elderly and by increasing natural decline.

The issue of population loss in the Great Plains is somewhat complex and controversial. From a regional perspective, the Great Plains actually increased its population base by more than 3.7 million people between 1950 and 1996. Hidden in the aggregate regional totals, however, is a very different picture of population redistribution. Most of the residential growth has been confined to metro counties. In fact, nonmetro counties lost nearly 223,000 people over the 46-year period.

Although the exact boundaries of the Great Plains are debated (see "What is the Great Plains?" on p. 5), one thing is clear: This 11-State area from Montana and North Dakota to New Mexico and Texas has lagged behind population advances in other regions for more than five decades. Most researchers attribute this situation to the region's dependence on agriculture.

Largest Cities Attract Great Plains Residents

The consolidation of residents in metro areas in the Great Plains was dramatic between 1950 and 1996 (table 1). During that time, the number of people living in metro areas grew by nearly 4 million (152 percent). What is particularly noteworthy is that the growth was sustained over each decade. In contrast, the nonmetro population declined by 5 percent. The limited residential growth that was sustained in nonmetro areas over the period occurred in larger urban centers. Urban nonmetro counties with a city of at least 20,000 people grew by 39 percent. The less urban nonmetro counties (with a city between 2,500 and 19,999) only managed minor growth spurts during the decades of the 1950's and 1970's. Although recent population estimates indicate this county grouping is once again growing, the aggregate population total for less urban counties in the region is still down slightly from what it was in 1950. Rural nonmetro counties (those that lacked a city of at least 2,500 people) showed the most dramatic decline, losing more than a third of their population base between 1950 and 1996.

This pattern of population redistribution is disturbing when placed in context. The 40 metro counties represent only 8.4 percent of all counties in the region but account for 93 percent of the total residential growth between 1950 and 1996 (fig. 1). When you combine the 40 metro counties with the 25 nonmetro counties containing large urban centers you find that almost all of the region's aggregate population growth since 1950 was concentrated in less than 14 percent of the region's counties. Most counties (52 percent) in the Great Plains are rural and their aggregate losses totaled over a half million people. In total, 323 of the region's 478 counties (68 percent) had a smaller population base in 1996 then they did in 1950. Thus, the aggregate population totals are misleading because they suggest that the entire region is growing when in fact

Richard Rathge is a professor in the departments of Agricultural Economics and Sociology at North Dakota State University and director of the North Dakota State Data Center. Paula Highman is a graduate assistant in the department of Sociology at North Dakota State University and researcher at the North Dakota State Data Center. This research was a cooperative project with Kansas State University through a grant from the Economic Research Service, USDA.

Table 1

Total population change in the Great Plains by county type, 1950-96

Population growth is concentrated in the metro counties

Year	Total	County type				
		Metro	Nonmetro*			
			Total	Urban	Less urban	Rural
			Number			
1950	7,053,856	2,603,544	4,450,312	785,667	2,188,804	1,475,783
1960	8,170,205	3,719,812	4,450,393	942,341	2,203,542	1,304,463
1970	8,562,139	4,386,611	4,175,528	970,156	2,068,663	1,136,645
1980	9,738,476	5,345,311	4,393,165	1,052,342	2,238,912	1,101,845
1990	10,116,614	5,931,534	4,185,080	1,061,915	2,133,919	989,194
1996	10,781,828	6,554,125	4,227,703	1,095,273	2,162,748	969,682
Change 1950-96:						
Population	3,727,972	3,950,581	-222,609	309,606	-26,056	-506,101
			Percent			
Rate	52.9	151.7	-5.0	39.4	-1.2	-34.3

* Nonmetro counties are classified into three subtypes: Urban nonmetro counties are counties with a city of at least 20,000 people, less urban nonmetro counties are counties with a city between 2,500 and 19,999 people, and rural nonmetro counties are counties without a city of at least 2,500 people.

Source: U.S. Bureau of the Census, decennial census counts and estimates from the Federal-State Cooperative for Population Estimates.

more than two-thirds of the counties in the region have declined in population.

Population Change a Mixed Bag

The history of population change in the Great Plains is marked by a mixture of growth and decline. Nearly 53 percent of the counties in the region had some period of growth between 1950 and 1996, but fewer than 9 percent of the counties posted continuous population gains (fig. 2). What is striking, however, is the fact that more than 38 percent of the counties consistently declined since 1950. Of the 184 continuous-decline counties, nearly one in five lost population at a rate in excess of 5 percent per decade. The areas dominated by persistent decline were in the Dakotas, northern Kansas, and north Texas where population losses are exacerbated by the sparsely populated character of the location. The most recent ranking of all 3,142 U.S. counties highlighted these trends, showing that two-thirds of the 50 counties posting the greatest proportional losses between 1950 and 1996 were from the Great Plains.

The Great Plains has been undergoing residential concentration for decades. Fifty-eight percent of the metro counties in the region sustained continuous population growth since 1950, while the remaining 42 percent had a mixed growth record (table 2). Nonmetro counties with large urban centers had a less impressive growth trend with a little over one in four sustaining constant growth. Nonetheless, none of these 25 counties consistently declined over the 46-year period. In contrast, over 48 percent of the rural nonmetro counties continuously declined since 1950, and 15 percent of the less urban nonmetro counties had a similar pattern of constant residential loss.

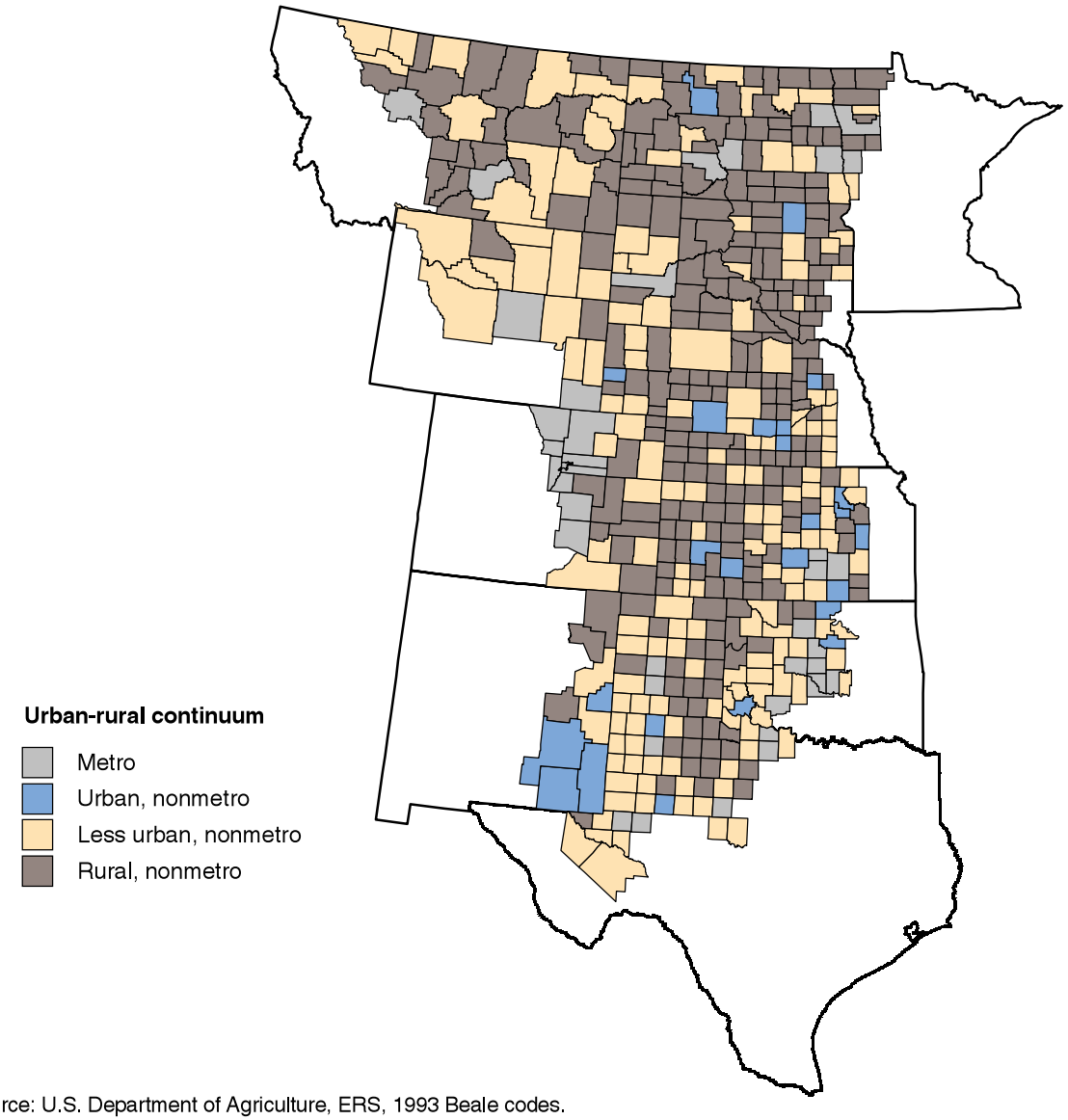
Agricultural Dependency Major Source of Population Loss

The Great Plains economy is still dominated by agriculture, and the majority of nonmetro counties in the region are classified as farm-dependent. Farm-dependent counties are those in which at least 20 percent of the total labor and proprietor income is derived from farming. Rural residential loss, especially in farm-dependent counties, is largely due to a lack of employment opportunities. Technological advances in agriculture have dramatically reduced the need for labor by increasing production and the amount of land one person can efficiently operate. For example, the index of agricultural output per hour of farm work rose about 1,300 percent between 1940 and 1989. Productivity has more than doubled per acre, while harvested cropland has remained relatively stable over the past four decades. As a result, average farm size has dramatically increased in the region, translating into reduced farm numbers and farm population. This downsizing has spilled over into neighboring farm communities in the form of fewer demands for services, which in turn, has reduced related employment opportunities in these communities.

Figure 1

Classification of counties in the Great Plains based on an urban-rural continuum

The Great Plains is dominated by nonmetro counties, especially those lacking an urban place



Source: U.S. Department of Agriculture, ERS, 1993 Beale codes.

The magnitude of farm population losses due to agricultural restructuring is overwhelming. For example, in 1940, those living on farms in the United States topped 30 million, or one-fourth of the Nation's population. Recent estimates suggest fewer than 5 million farm residents, representing less than 2 percent of the Nation's current population.

Evidence of the selective nature of rural population loss in the Great Plains is shown in figure 3. More than half of the continuously declining counties in the region had at least 38 percent of their total employment based in agriculture. In contrast, only 2 percent of the counties with that level of agricultural employment consistently grew since 1950. On the other hand, more than three-quarters of continuous-growth counties had an agricultural employment base under 16 percent.

Few Youth and More Elderly in Great Plains

A consequence of the selective nature of population redistribution in the region is a changing age profile. Residents who leave, especially for employment reasons, tend to be in their early or midcareer stages. This form of selective migration distorts the age structure of a county by decreasing the number of young adults and enlarging the proportion of elderly. Nearly half of the continuously declining counties had a median age above 35 years (fig. 4). In contrast, the median age in more than two-thirds of the continuous-growth counties was under 29 years.

This disparity highlights a growing elderly population located largely in rural counties that are consistently declining. For example, seniors (age 65 and over) averaged more than 15 percent of the total population since 1950 in nearly one-third of the Great Plains counties. Seniors represented only 8 percent of the national population in 1950, and their proportion is still under 13 percent today. Two-thirds of these counties with high concentrations of elderly have consistently declined since 1950, while none have consistently grown. This imbalance reflects the disproportional movement of young adults and families from rural counties to larger metro centers. Thus, the elderly who remain behind represent a growing proportion of the rural population.

A deficit of young adults has important ramifications for the county's ability to grow. The loss of young families results in a corresponding reduction in children. An imbalance in the age structure caused by the outmigration of young adults leads to a natural decrease (when more people die in a county than are born). Natural-decrease counties are extremely vulnerable, because population growth depends on their ability to offset natural decline with net inmigration.

Table 2

Growth pattern in the Great Plains by county type, 1950-96

Sustained population growth occurred predominately in metro counties, while continuous population loss was found mainly in rural nonmetro counties

			County type							
					Nonmetro*					
Growth pattern	Total		Metro		Urban		Less urban		Rural	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Continuous growth	39	8.2	23	57.5	7	28.0	8	4.8	1	0.4
Mixed growth-decline	294	61.5	17	42.5	18	72.0	133	80.1	126	51.0
Continuous decline	145	30.3	0	0	0	0	25	15.1	120	48.6
Total	478	100.0	40	100.0	25	100.0	166	100.0	247	100.0

* Nonmetro counties are classified into three subtypes: Urban nonmetro counties are counties with a city of at least 20,000 people, less urban nonmetro counties are counties with a city between 2,500 and 19,999 people, and rural nonmetro counties are counties without a city of at least 2,500 people.

Source: U.S. Bureau of the Census, decennial census counts and estimates from the Federal-State Cooperative for Population Estimates.

Data and Definitions

Data

Data were obtained from the U.S. Bureau of the Census from three major sources: decennial census, from 1950-90; population estimates from the Federal-State Cooperative for Population Estimates (FSCPE); and various editions of the *County-City Data Book*.

Definitions

Growth county codes—

Continuous-growth counties included those counties that had consistently higher decennial census counts between 1950 and 1990 and higher population estimates in 1996 than in 1990. Mixed-growth counties posted a decennial gain between 1950 and 1990, or a higher population estimate in 1996 than in 1990, but had interrupted growth during that time span. Continuous-decline counties had consistently lower decennial census counts between 1950 and 1990 and a lower 1996 population estimate than 1990.

County codes—

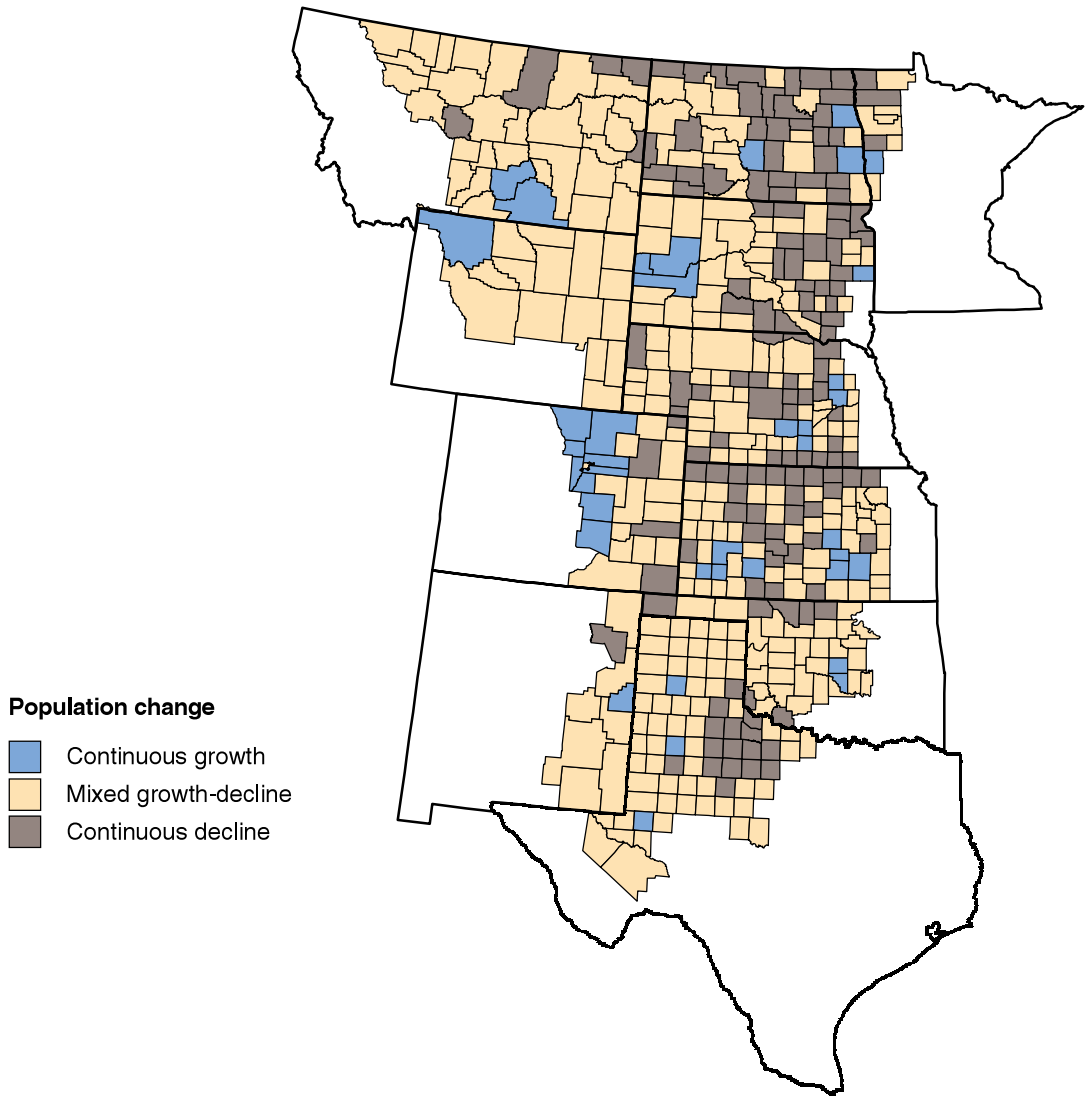
Metro counties contained either a place with a minimum population of 50,000 or an urbanized area with a total population of at least 100,000. Nonmetro counties were divided into three groups based on the size of their largest city: (1) urban counties had a city of at least 20,000 residents, (2) less urban counties had a city of between 2,500 and 19,999 residents, and (3) rural counties lacked a city of at least 2,500 residents.

Median age was abstracted from census data for the years 1960, 1970, 1980, and 1990. An average was calculated to serve as our point estimate. Agricultural employment was based on the percentage of total employment in agriculture. Prior to 1970, total employment was based on civilians 14 years of age and over and then shifted to 16 years of age and over. A four-decade average was used in the analysis.

Figure 2

Pattern of population change in the Great Plains, 1950-96

Although population change in the Great Plains has been mixed, very few counties have sustained continuous growth



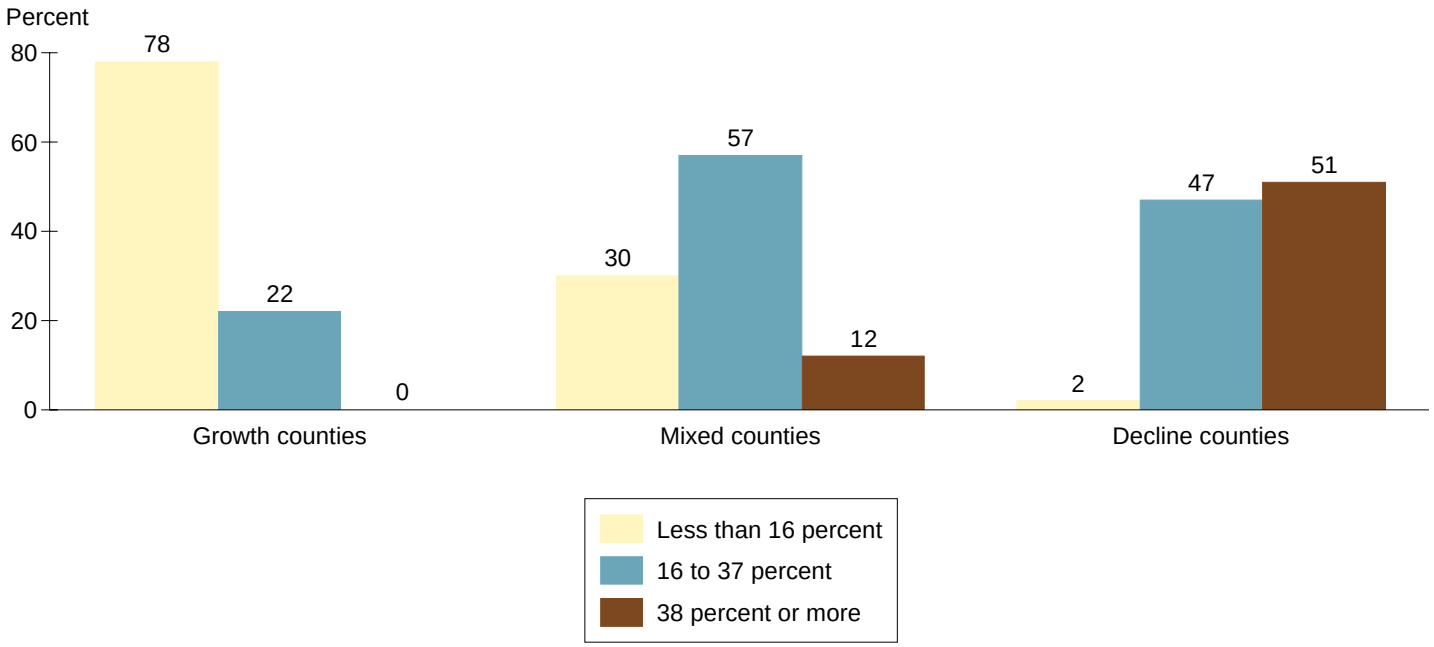
Source: U.S. Bureau of the Census, Decennial Census counts and estimates from the Federal-State Cooperative for Population Estimates.

Natural decrease in the Great Plains is a pressing concern (fig. 5). Forty-one percent of the counties in the region experienced a natural decrease between 1950 and 1996. Closer inspection shows that nearly two of three naturally declining counties have been losing population consistently since 1950. The viability of many of these rural counties is not optimistic. Unless economic development activities dramatically alter their employment potential, the likelihood that these counties will break their downward cycle of population loss is slim.

Collaboration and Continued Research Key to Great Plains Future

The general trend derived from this research is that agriculture-dependent counties (those with high concentrations of agricultural employment) are at greatest risk of persistent population loss. Technological advances, along with increased global competition, have dislocated agriculture-related labor. Migration of young adults compounds the situation by intensifying the concentration of elderly remaining in economically vulnerable counties. The cumulative effect of agricultural restructuring is a region with numerous counties ill-positioned for future viability. This situation requires the attention of researchers and policymakers.

Figure 3
Distribution of Great Plains Counties by proportion employed in agriculture
Counties wuth decling population are the most depentent on agriculture



Note: Figures are based on an average over four decades.
Source: U.S. Bureau of the Census, *County-City Data Book*; various years.

One area that deserves attention by researchers is the limitation of regional analysis. This research clearly shows how impressions of residential change may be misleading based on regional totals. The implicit assumption of regional analysis is that regions are homogenous. Such an approach may detract from our ability to adequately explore smaller trends within a region. For example, two prominent themes that emerged from our research are the common difficulties among agriculture-dependent counties and the resultant high concentrations of elderly in economically depressed counties.

Additionally, this study shows the important need for continued research and policy initiatives regarding rural development, especially those targeting continuously declining areas. We need to understand these areas better to design innovative solutions. Some recent technological advances are providing more employment opportunities for rural areas simply by reducing the barrier of distance. However, many rural areas are not well positioned to adjust to the global economy in which they will need to compete.

Policymakers and planners also face a formidable challenge in dealing with persistently declining counties. Some observers feel that not all communities are viable; therefore, programs and initiatives should be selectively targeted to use scarce resources effectively. Great Britain's success in rural community triage is often cited as an illustration of such a policy approach. Others argue for a more collaborative approach to community development that focuses on cooperative ventures among varied levels of government or organizations. Some note that an important starting point should be the reexamination of traditional community boundaries. More effective communication and transportation systems have dramatically changed access and have opened the opportunity for community clusters in such areas as public service delivery or infrastructure, education, public safety, health care, and emergency services. Researchers have concluded that the benefits of a collaborative approach include (1) economic efficiencies arising from economies of size, (2) more access to resources, (3) expanded markets, and (4) synergism.

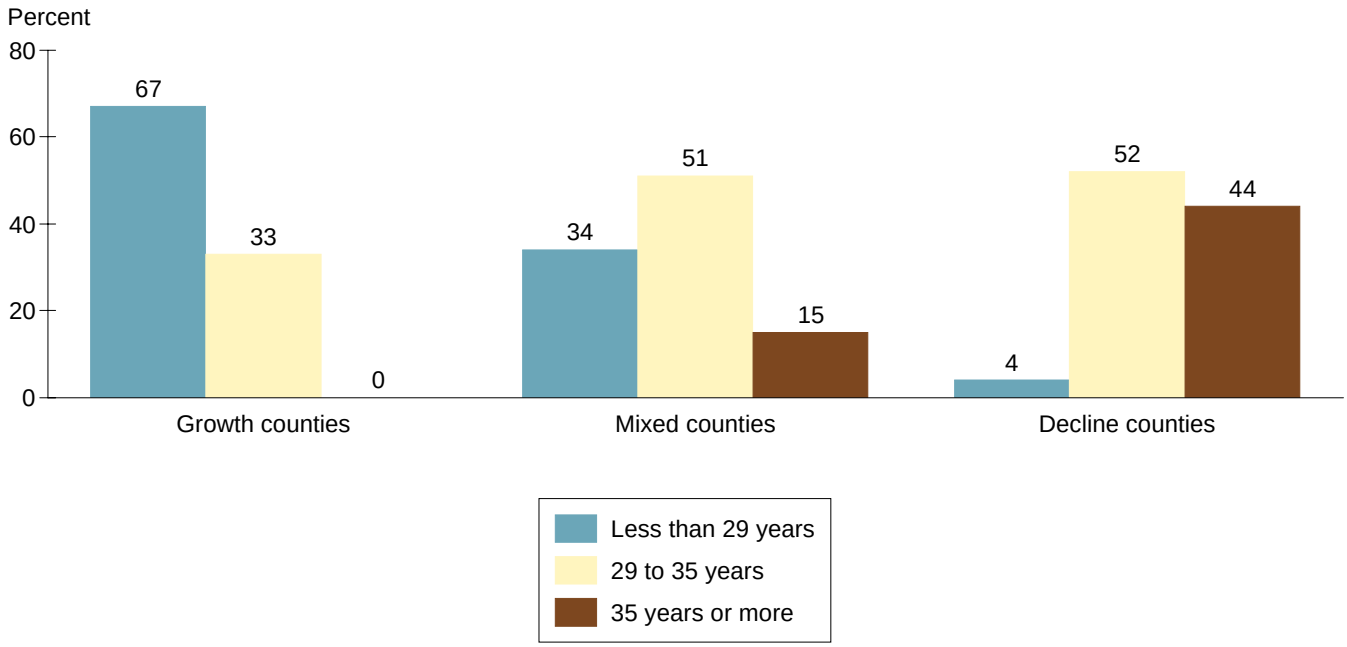
However, collaborative action also has its limitations and barriers. Cooperation is one of the more difficult hurdles to overcome because of issues of local pride and jealousy. Other obstacles include maintenance of the collaborative efforts, undermining of local organizations and voluntary efforts, and issues of political jurisdiction.

Greater efforts need to be directed at improving the situation in the Great Plains. New legislation from the farm law to welfare reform will have a significant impact on many rural areas of the region, especially those that rely

Figure 4

Distribution of Great Plains counties by median age, 1950-90

Counties with declining population have a higher proportion of older residents



Note: Figures are based on an average over four decades.
Source: U.S. Bureau of the Census, *County-City Data Book*; various years.

heavily on Federal funds. It is important, therefore, that continued research and attention be given to this unique region of the United States.

For Further Reading . . .

Don E. Albrecht, "The Renewal of Population Loss in the Nonmetropolitan Great Plains," *Rural Sociology*, Vol. 58, No. 2, 1993, pp. 233-246.

Thomas L. Daniels and Mark B. Lapping, "Small Town Triage: A Rural Settlement Policy for the American Midwest," *Journal of Rural Studies*, Vol. 3, No. 3, 1987, p. 273-280.

Glenn V. Fuguitt, David L. Brown, and Calvin L. Beale, *The Population of Rural and Small Town America*, New York: Russell Sage, 1989.

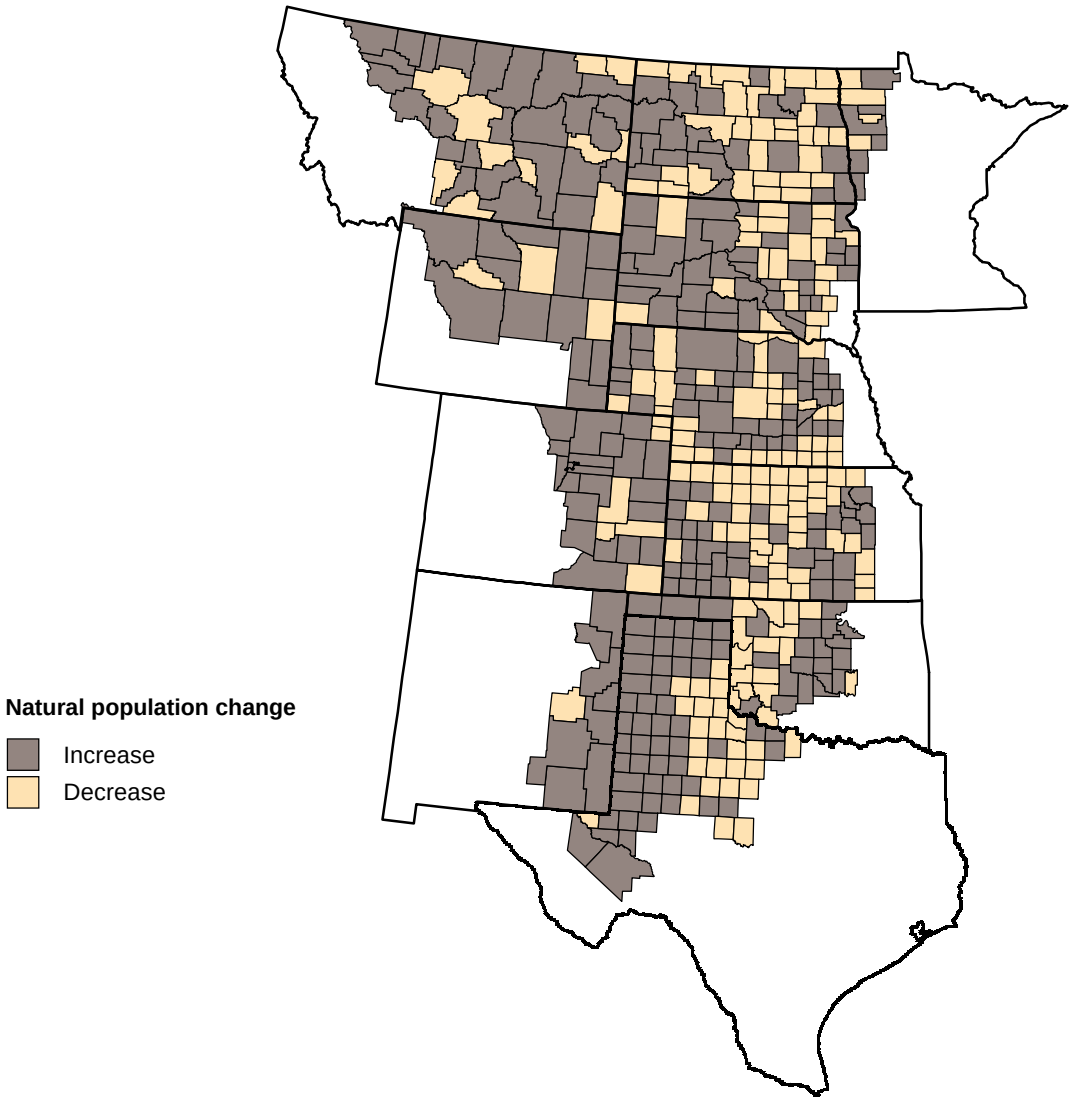
Great Plains Agricultural Council, *Implications of Changing Patterns of Government Expenditures in the Great Plains*, Government Expenditures Task Force of the Great Plains Agricultural Council Economic Committee, 1995.

P. F. Korsching, T. O. Borich, and J. Stewart (eds.), *Multicommunity Collaboration: An Evolving Rural Revitalization Strategy*, Ames, IA: North Central Regional Center for Rural Development, 1992.

Figure 5

Natural increase and decrease counties in the Great Plains, 1990-96

More deaths than births occurred in 41 percent of the Great Plains counties and the vast majority of these counties have experienced continuous population loss since 1950



Source: U.S. Bureau of the Census, Federal-State Cooperative for Population Estimates.

John B. Cromartie

Net Migration in the Great Plains Increasingly Linked to Natural Amenities and Suburbanization

Over 90 percent of counties in the Great Plains experienced an upward trend in net migration from the mid-1980's to the mid-1990's, in the form of lower net outmigration, higher net inmigration, or a switch from out- to inmigration. Net outmigration persisted in sparsely settled, isolated areas and in areas where jobs depended on the extraction of energy resources. However, migration in the mid-1990's was associated less with rural-urban location and employment and more with increased commuting from suburban fringe counties and movement to the few areas in the region with high natural amenities.

Net migration—the difference in the number of people moving to and from a given area in a given time period—added population to the Great Plains region in recent years, following several years of losing population. More people are moving into the region than leaving, but since migration rates vary considerably from county to county, the potential benefits of population and job growth associated with net inmigration are not spread evenly over the landscape. A majority of counties, especially those far from metro areas and those with little or no urban population of their own, continually lost population from net outmigration during 1994-96.

County-level net migration is increasing in the Great Plains in response to changes taking place within and outside the region, but in ways distinctly different from the rest of the country. Several factors account for the recent upturn. First, unlike other U.S. regions, urbanization continues to explain much of the overall net migration pattern in the Great Plains, although the strength of the association weakened between the 1980's and 1990's. Sparsely settled sections in the Great Plains continue to lose population to nearby cities and larger cities outside the region. Second, a small number of counties with high natural amenities, such as warm climates and varied topography, have attracted larger numbers of new residents, whether rural or urban. Third, to a degree not found elsewhere, large portions of the Great Plains remain dependent on place-specific natural resources, having never developed a manufacturing base other than one related to agriculture. Direct, nonproprietor employment in farming is now so low as to have minimal effect on migration patterns, even in the Great Plains, but the latest round of downsizing in the oil and gas industries explains much of the continued net outmigration. Fourth, nonmetro counties within commuting distance to large urban centers increased their net migration share considerably between the 1980's and 1990's as suburbanization expanded.

Widespread population growth is underway in much of nonmetro America, mostly as a result of favorable net migration. In many fast-growing sections of the country, emerging migration patterns coincide with economic growth, which is associated with the residential and recreational attractiveness of natural amenities rather than with the extractive value of natural resources or production-related advantages. Owing to the diversity of nonmetro America, it is important for regional policymakers to understand the causes of demographic changes in such settings as the Great Plains. The Great Plains is unique because of its long history of net outmigration, especially from rural, isolated districts, its continued concentration of population into metro areas and moderately sized non-

John Cromartie is a geographer in the Food Assistance, Poverty, and Well Being Branch of the Food and Rural Economics Division, ERS, USDA.

metro cities, its continued economic dependence on agriculture and mining, and its limited natural amenities.

Areas in the Great Plains have traditionally built their economies on advantages in natural resources important to agriculture and mining (including oil and gas). Long-term productivity increases in agriculture, and more recently in mining, have caused these industries to require fewer workers over time, as reflected in employment declines and six decades of almost continous population loss. New economic activities evolved in parts of the Great Plains based on production factors important to manufacturing, such as low wages and abundant land, but never as strongly as in other parts of the country. Many communities in the Great Plains failed to develop a manufacturing base as an alternative to agriculture during the rural manufacturing growth spurt of the 1960's and 1970's. Additionally, natural amenities—the basis for tourism and recreation—have always been important to rural growth, but their role is increasing as a result of increasing locational flexibility on the part of firms and households. The effect of urban concentration on migration is decreasing and that of natural amenities is increasing, as more and more people are able to act upon their preferences for high-amenity, rural settings. Challenges to building and maintaining sustainable economic growth are formidable in the large number of rural communities in the Great Plains that have not attracted manufacturing industries and cannot serve as bedroom communities or tourist destinations.

The following section begins with an overview of metro and nonmetro net migration trends in the Great Plains, 1970-96, followed by a more detailed comparison of two 3-year periods, 1984-86 and 1994-96. (See "Measuring Net Migration" for a summary of data sources.) Separate analysis of the mid-1980's and mid-1990's shows the changing importance of urbanization, natural amenities, employment, and commuting in explaining patterns of net migration in this region.

Great Plains Net Migration Rebounded in the 1990's

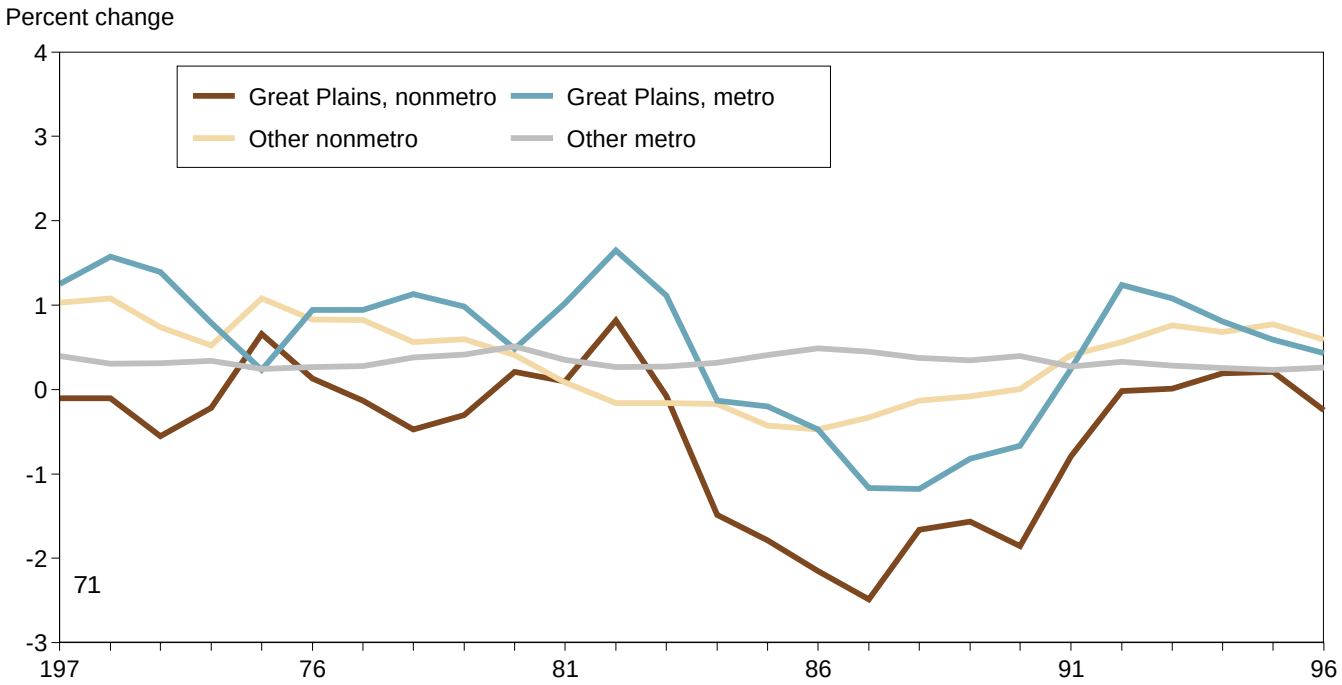
The Great Plains is home to 10.8 million people spread across nearly one-fifth of the Nation's continental territory (see fig. 2, p. 4). The region contains only one metro area with more than 1 million people (Denver) and one-quarter of the region's population lives in nonadjacent nonmetro areas compared with one-twelfth for the rest of the Nation. Metro residents in the Great Plains are much more likely to reside in cities below 250,000 (such as Bismarck, Casper, and Amarillo) than is true for metro residents elsewhere.

In the 1970's, net migration for the nonmetro Plains as a whole hovered around zero (fig. 1), as movement into

Figure 1

Annual net migration rates by region and county type, 1970-96

Population loss from net migration in the nonmetro Great Plains exceeded 2 percent in mid-1980's and has since recovered



Note: Metro areas defined as of June 1993.

Source: Calculated by ERS using data from the Bureau of the Census and the University of Wisconsin-Madison.

Table 1

Net migration rates by rural-urban category, Great Plains and rest of United States, 1984-86 and 1994-96

Most categories switched to positive population growth in the Great Plains during the 1990's

Rural-urban category	1984-86		1994-96	
	Great Plains	Other United States	Great Plains	Other United States
	Percent			
Metro area with population > 1,000,000	-0.20	0.52	1.07	0.14
Metro area with population 250,000-1,000,000	-.34	.41	.52	.46
Metro area with population 50,000-250,000	-1.16	.04	.28	.39
Nonmetro, adjacent to metro	-1.96	-.15	.37	.78
Nonmetro, not adjacent to metro, urban population > 20,000	-1.74	-.46	-.46	.28
Nonmetro, not adjacent to metro, urban population 2,500-19,999	-2.50	-.90	.19	.59
Nonmetro, not adjacent to metro, completely rural	-2.19	-.77	-.06	1.00

Source: U.S. Bureau of the Census.

mining and some irrigated farming areas tended to offset losses from dry farming and ranching areas. In the 1980's, though, net outmigration developed and deepened to more than 2 percent annually by 1987. The rest of the nonmetro United States lost population from net outmigration as well, but at much more modest levels. Only at the beginning of the 1990's did net outmigration from the Great Plains moderate significantly. This happened quickly, and in the early 1990's net outmigration reversed to net inmigration until 1996. Thus, the Great Plains region has participated in the general rebound of U.S. rural and small town population growth since 1990, albeit at a lower rate than is true elsewhere.

Metro areas in the Great Plains showed consistently higher population growth from migration than the nonmetro areas during 1970-96, but even they experienced net outmigration in the 1980's. They recovered during the 1990's, although net inmigration rates peaked in 1992 with lower increments since then. This falloff is at least partly caused by accelerated outmigration from the many metro areas in the region with military bases.

Rural-urban migration patterns are changing in the Great Plains, in ways distinctly different from the rest of the country, as seen in comparisons of average annual rates of net migration for 1984-86 and 1994-96 (table 1). (See "Measuring Net Migration" for a discussion of the rural-urban categories used here.) Rural-urban net migration in the Great Plains followed a pattern similar to that of the rest of the country during the 1980's. In both cases, migration rates were highest in the most urban category (metro areas with 1,000,000 or more people) and generally decreased with urban size. All types of counties were losing population through net outmigration in the Great Plains, and losses in nonmetro categories were especially high compared with other parts of the country.

In the 1990's, the Great Plains continued to show concentrating tendencies, especially into the Denver metro area from the more sparsely settled parts of the region, while the rest of the Nation saw widespread movement from big cities to rural territory. Nonadjacent, completely rural nonmetro locations were the fastest growing rural-urban category elsewhere during 1994-96, but in the Great Plains, these areas continued to lose residents. However, within all rural-urban categories in the Great Plains, growth was higher in the 1990's and differences among categories diminished. Migrants still favor large urban areas in the Great Plains, but the rural-urban movement has weakened somewhat.

Net outmigration is still the pattern in most Great Plains counties, especially in very rural and/or agriculturally dominated areas (fig. 2). Where losses continue, they have typically been smaller than was true of the 1980's. Exceptions include counties in southwest Kansas where the meatpacking industry grew rapidly in the 1980's and has since leveled off and oil and gas areas in western Texas. Much of the nonmetro net inmigration during the 1990's is accounted for by counties along the western edge of the region, a mixture of areas growing from commuting to larger centers or from proximity to outlying mountainous enclaves that have attracted newcomers, such as the Black Hills in southwestern South Dakota or the Big Horn Mountains in north-central Wyoming.

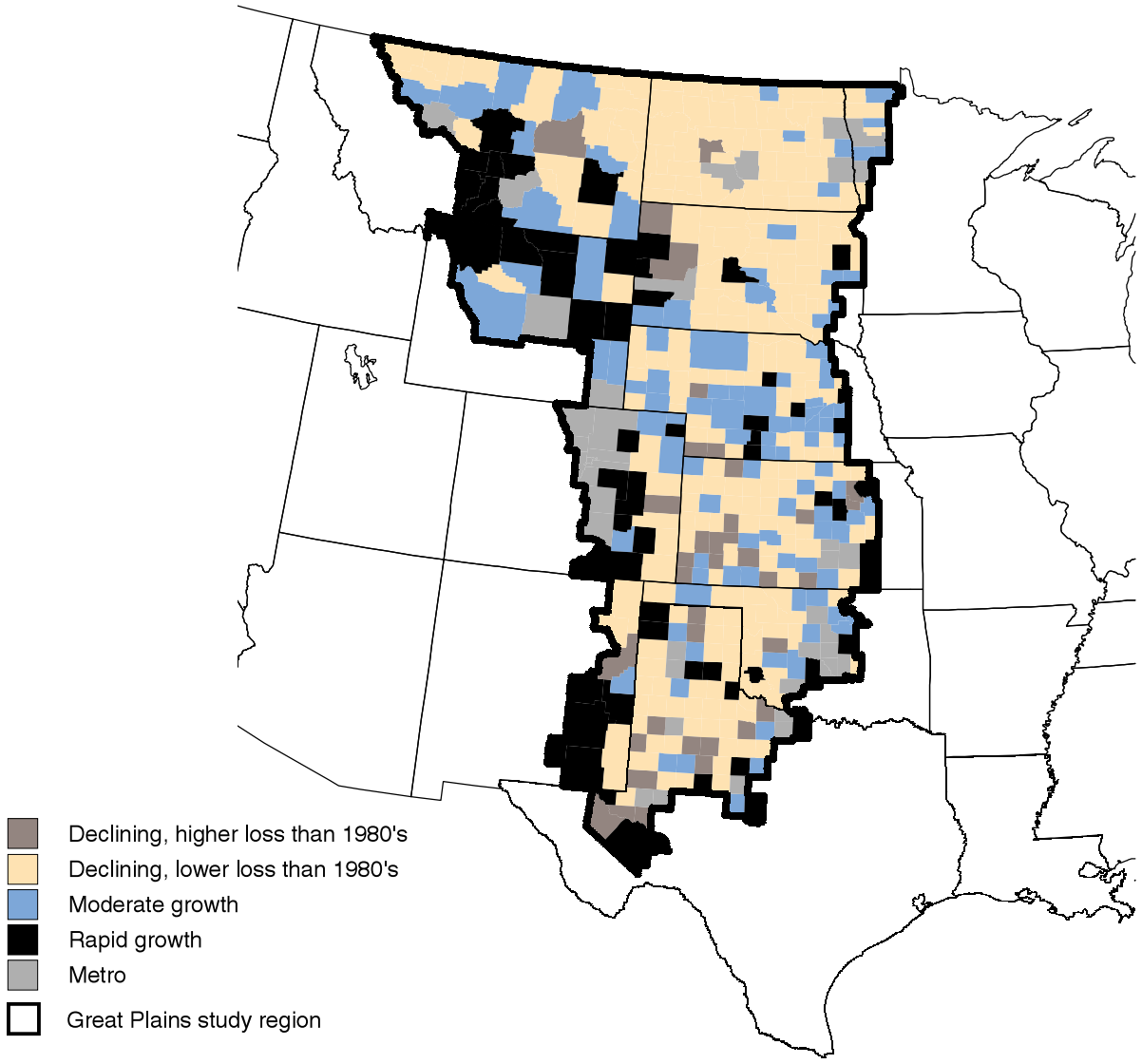
Natural Amenities and Commuting Account for an Increasing Share of Net Migration Growth in the Great Plains

Although net migration levels continue to be lower in the Great Plains than elsewhere, with sparsely settled, outlying districts still losing more residents than they gain, a distinct and widespread upturn in net migration rates

Figure 2

Nonmetro population change from net migration, 1990-96

Most Great Plains counties continue to lose residents, but not as many as in 1980's



Source: Calculated by ERS using data from the Bureau of the Census.

Measuring Net Migration

The basic units of analysis were 478 metro and nonmetro counties comprising the Great Plains (see "What is the Great Plains?"on p. 5 for a delineation of the Great Plains). Annual estimates of county net migration were obtained from the Bureau of the Census for 1990-96 and from a special file created from Census Bureau data by Glenn Fuguitt at the University of Wisconsin-Madison for 1970-89. Annual net migration rates were expressed as the percentage change in population from net migration during the given year. Migration was measured from July to July except in the decennial census years (1970, 1980, and 1990) when migration was measured from April to July of the following year; rates were adjusted to account for the extended time period. To compare trends over time, average annual net migration rates were calculated for two 3-year periods: 1983-84, 1984-85, and 1985-86 (referred to as 1984-86, for short) and 1993-94, 1994-95, and 1995-96 (1994-96).

Rural-urban location within the Great Plain's settlement system was measured using the Economic Research Service's Rural-Urban Continuum Code, a 10-level refinement of the 1993 Metro Area system. Some categories were combined for this analysis, resulting in three metro and four nonmetro levels. Metro areas are distinguished on the basis of population size, while nonmetro categories are based on adjacency to metro areas and size of the urban population. A series of dummy variables was created for the regression analysis, with the largest metro category serving as the reference.

Natural amenities are measured using a single index, also created at the Economic Research Service, combining normalized measures of climate, topography, and the presence of bodies of water. The index of climate attractiveness is defined using January temperature, number of days with sun in January, July temperature (expressed as a residual when regressed against January temperature), and July humidity. Topography is defined as the difference between an index of mountainous or rugged terrain and average elevation. The presence of bodies of water is measured using the percentage of land area covered by water.

Employment structure is measured using four-digit Standard Industrial Classification (SIC) of employment by county, provided by the Bureau of Labor Statistics in a data series known as ES-202. Data include only workers covered by State unemployment insurance and Federal unemployment compensation. Sole proprietors are not included. Data for Wyoming were not available so it was excluded from the regression analysis (but included in the descriptions of migration trends).

The advantage of ES-202 data compared with other employment and earnings series is the four-digit detail. In comparison with the 10 sectors derived from 1-digit SIC codes, this breakdown more accurately divides industries along lines in which current economic restructuring is taking place. The variables measure the average annual number of employees in each of the economic sectors as a percentage of total employment in the county. Employment data for 1984 were used for modeling 1984-86 migration, while data for 1993 (the latest available at the time of the analysis) were used for modeling 1994-96 migration.

Counties with high levels of commuters were distinguished by measuring the percentage of the working population who worked outside their county of residence in 1990.

occurred between the mid-1980's and mid-1990's. Several possible explanations account for this upward trend:

Urbanization. Migration appears to be strongly associated with continued urbanization in the Great Plains, at a time when other parts of the country are decentralizing. The Denver metro area is growing from migration at twice the rate of other metro categories in the region, which in turn are growing at twice the rate of nonmetro categories (table 1). Nonmetro counties with large cities attract or retain far fewer migrants than larger metro centers. Sparsely settled counties with at least a small urban center have net inmigration on average, while those without a center are still losing residents.

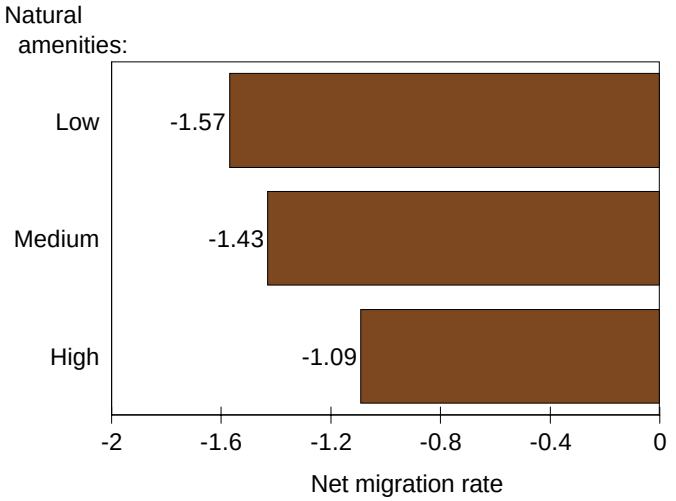
Natural Amenities. Despite the lack of extensive territory with high natural amenity endowments, the physical qualities of the landscape associated with recreation and tourism may be assuming greater importance in explaining net migration patterns in certain sections of the Great Plains. A relatively small number of counties with attractive physical qualities, as measured by climate, topography, and presence of lakes or streams, captured a larger share of net migration in the 1990's than in the 1980's (figs. 3 and 4). High-amenity counties are typically found where the Great Plains meet the Rocky Mountains along the western edge of the region, and in Southern States with warmer climates. Many of the fastest growing metro centers are located along the front range of the Rocky Mountains, thus urbanization and high-amenity growth are to some extent overlapping.

Jobs. Changing employment patterns may also alter net migration rates. In the past, the reduced demand for agricultural labor and the lack of alternative employment provided the primary impetus for outmigration from the Great Plains. Many counties in the Plains depend on agriculture, where increases in productivity and land retirement have reduced manpower needs. Where an alternative industry exists, it is usually mining, as seen in the oil and gas fields of Texas, Kansas, or the Williston Basin in North Dakota, or the low-sulphur coal operations in the northern Plains. But collectively, jobs in mining were also retreating since 1982. Portions of the Plains thus took a double economic hit. If these industries are contributing as much to outmigration in the 1990's as in the 1980's, then other factors would have to account for the increase in net migration between decades, such as manufacturing

Figure 3

Average annual net migration rates in the Great Plains by level of natural amenities, 1984-86

Low-amenity counties lost more residents in the 1980's...



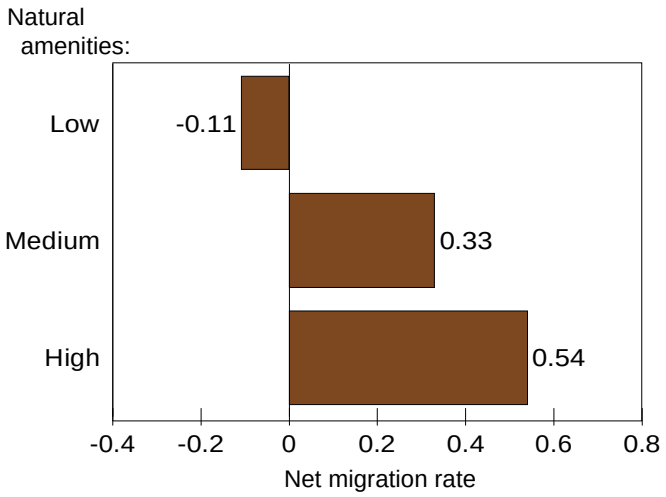
Note: Natural amenities are measured using the ERS natural amenities index. See p. 31 for a definition. The high and low categories measure the net migration rate for the 25 percent of counties with the highest and lowest natural amenities, respectively.

Source: Calculated by ERS using data from the Bureau of the Census and the University of Wisconsin-Madison.

Figure 4

Average annual net migration rates in the Great Plains by level of natural amenities, 1994-96

...and continued to decline as higher amenity areas switched to net inmigration in the 1990's



Note: Natural amenities are measured using the ERS natural amenities index. See p. 31 for a definition. The high and low categories measure the net migration rate for the 25 percent of counties with the highest and lowest natural amenities, respectively.

Source: Calculated by ERS using data from the Bureau of the Census and the University of Wisconsin-Madison.

and service jobs, which have been increasing in certain areas of the Great Plains and may be exerting a positive effect on net migration.

Commuting. Anecdotal evidence suggests that an increasing number of urban workers in the Great Plains are choosing to live and raise families outside city environments to take advantage of real or perceived rural amenities, such as cheaper land and housing, better school systems, lower crime, and a less hurried, more personal social atmosphere. Increased long-distance commuting between the 1980's and 1990's would increase net migration rates in sparsely settled, newly suburbanizing territory on the fringes of the region's cities.

The Changing Importance of Factors Explaining Migration. The relative importance of urbanization, natural amenities, and commuting on net migration changed considerably between the 1980's and 1990's while job-related factors did not (figs. 5 and 6). These statistics are calculated using ordinary least squares regression, a technique that includes several possible explanatory variables at the same time in measuring their influence on the dependent variable. In this case, the dependent variable is the average annual rate of net migration in the Great Plains, analyzed separately for 1984-86 and 1994-96, and the explanatory variables are a set of county characteristics measuring rural-urban location, natural amenities, employment patterns, and commuting (see "Measuring Net Migration").

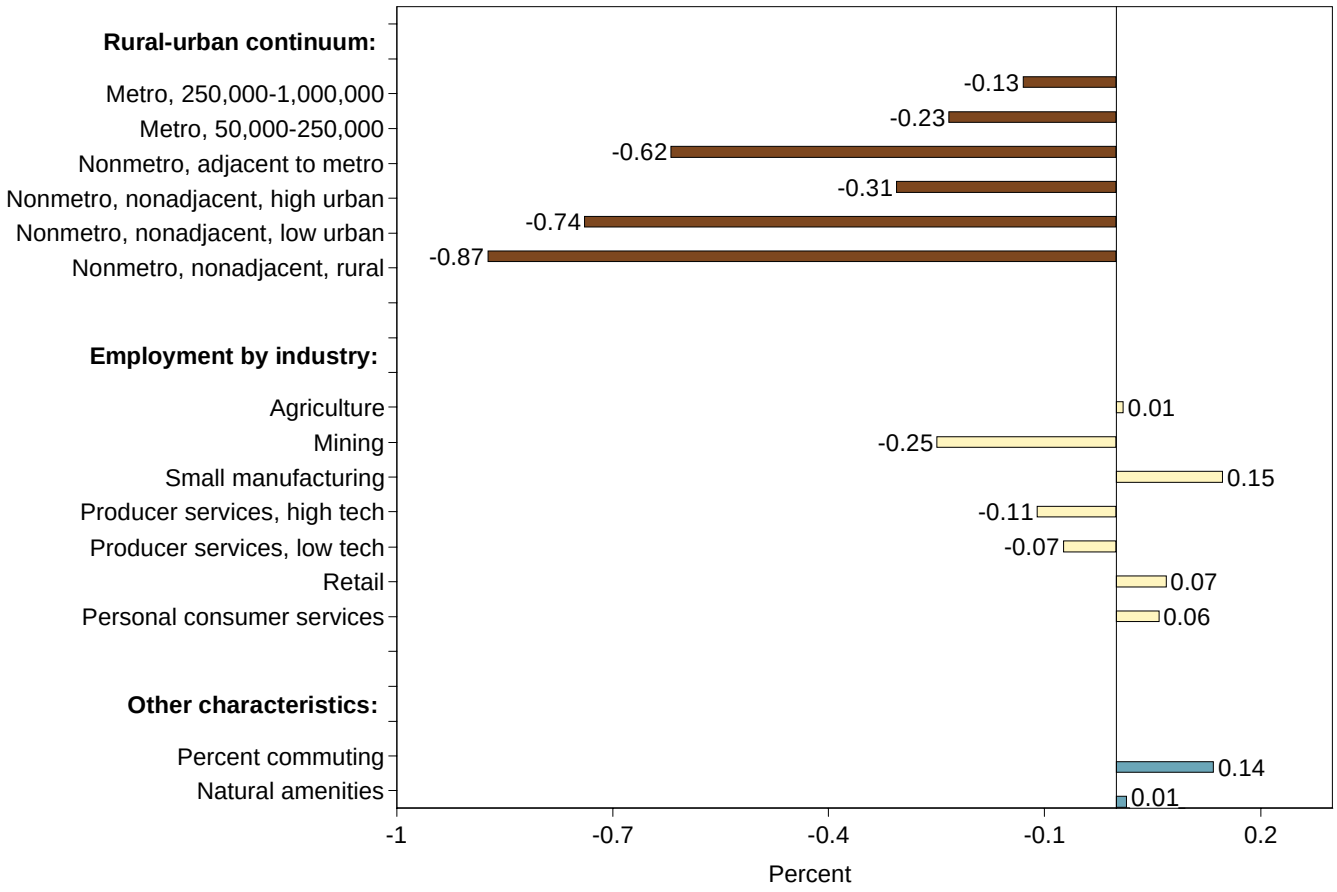
Net migration was strongly associated with concentration along the rural-urban continuum in the 1980's (fig. 5). The fact that all values for the rural-urban continuum fell below the zero line means that every type of area was losing residents relative to the region's largest metro area, Denver, which serves as a reference category. Not only were places losing out to Denver, but the amount of loss increased from the most urban to the most rural places. During the 1980's, the choices migrants made contributed to the relocation of population toward the higher end of the urban spectrum. The effects of other factors were small compared with urban concentration. The next strongest effect came from the push factors associated with areas dependent on mining and the pull factors in areas with high levels of small-scale manufacturing and high levels of commuting. Employment on farms had reached such low levels that its effect on net migration was almost nonexistent, even at the height of the 1980's farm crisis.

In the 1990's, the relative importance of rural-urban location in explaining net migration fell off while the influence of natural amenities and commuting increased dramatically (fig. 6). Denver still outperformed the rest of the region, as indicated by the negative values for the

Figure 5

Effect of county characteristics on average annual net migration rates in the Great Plains, 1984-86

Net migration decreased with urban influence and mining, increased with small-scale manufacturing in the mid-1980's



Source: Produced by ERS using data from the Bureau of the Census, the University of Wisconsin-Madison, and the Bureau of Economic Analysis.

rural-urban continuum categories. However, the effect of urbanization relative to other factors dropped considerably, and there was no longer a clear hierarchical pattern from most to least urban as was apparent in the 1980's. The most rural, isolated areas remained as the only part of the Great Plains still losing a significant share of migrants relative to Denver in the mid-1990's. The combination of low population density and physical isolation still appears to create a set of conditions conducive to high outmigration, independent of other explanatory factors, such as the negative effect of a strong dependence on mining.

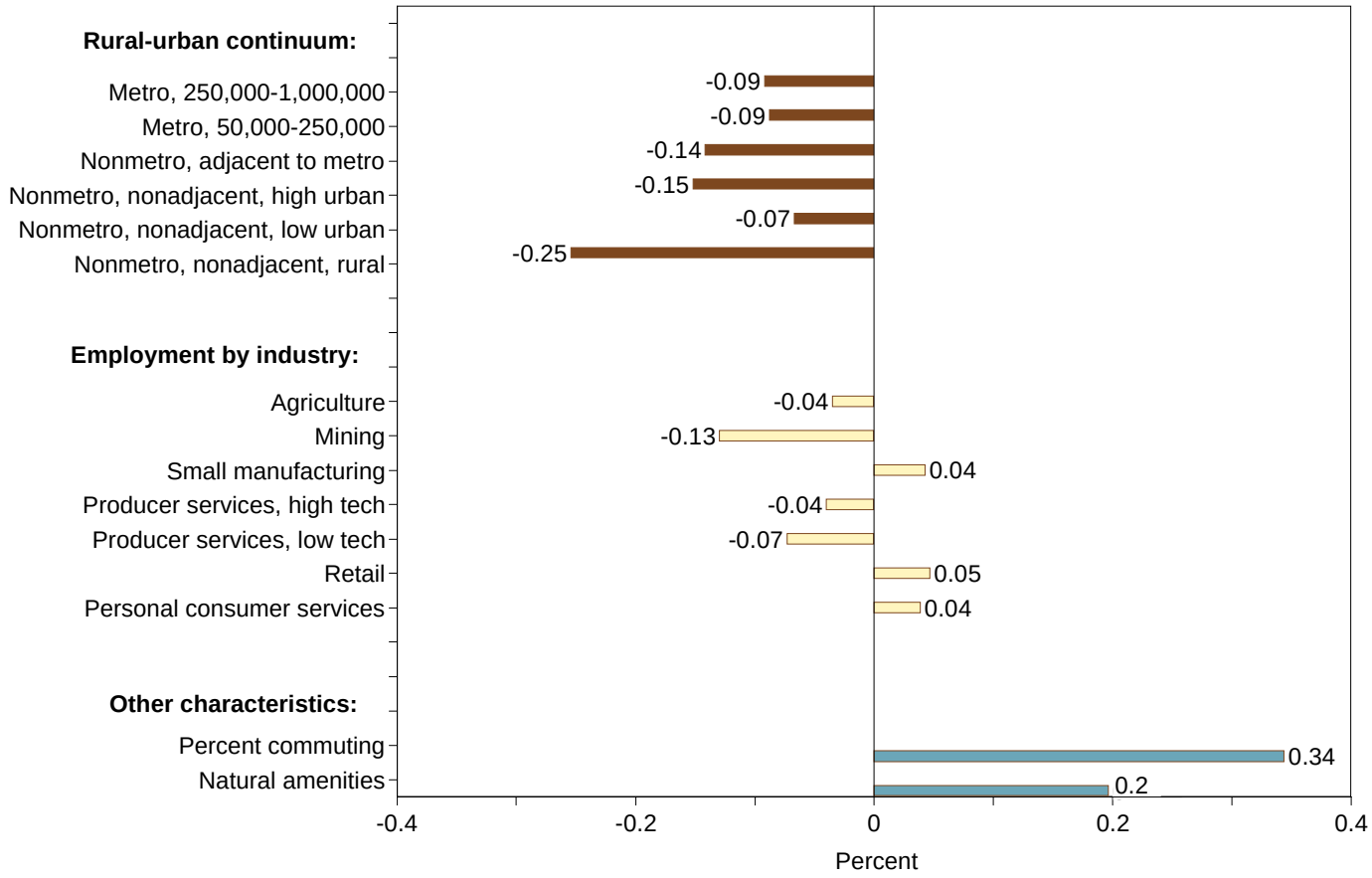
The most notable changes between decades were the dramatic increases in the relative effects of both commuting and natural amenities in explaining net migration. Long-distance commuting in the Great Plains increased to the point where the location of bedroom communities was the most important factor explaining net migration patterns in the mid-1990's. The fastest-growing places in the region can be found on the urban fringes. Physical qualities conducive to recreation are limited in the Great Plains relative to other regions of the country, such as the Rocky Mountains. Nonetheless, more migrants were attracted to the region's natural amenities in the 1990's than previously; the index used to measure natural amenities shifted from having no effect on net migration in the 1980's to having the second largest positive effect on net migration after the effect of commuting.

The effect of nonproprietor agricultural employment on net migration switched from positive in the 1980's to negative in the 1990's, but both were so small that it would be more accurate to interpret the relationship as zero in both time periods. The same could be said for the other employment sectors, with the exception of small-scale manufacturing, which encouraged net inmigration in the 1980's but had little effect in the 1990's, and mining, which had an equally negative effect on migration in both decades. High employment in the retail and personal

Figure 6

Effect of county characteristics on average annual net migration rates in the Great Plains, 1994-96

Migration moved into scenic areas and bedroom communities in the 1990's



Source: Produced by ERS using data from the Bureau of the Census, the University of Wisconsin-Madison, and the Bureau of Economic Analysis.

consumer services sectors are often associated with areas with high natural amenities, but the amenities themselves and not the jobs seem to be attracting migrants to these areas at the moment. As these areas grow, more of the migrants will probably be attracted by the jobs opening up to serve the growing population base as well as the nice scenery and recreational opportunities. If so, employment in amenity-related service sectors may become increasingly associated with net migration in the Great Plains, mitigating to some degree the effect of the natural amenities themselves.

For Further Reading . . .

David L. Brown, "Potential Impacts of Changing Population Size and Composition of the Plains," in M. P. Lawson and M. E. Baker, eds., *The Great Plains: Perspectives and Prospects*, Lincoln, NE: University of Nebraska Press, 1981.

John B. Cromartie and Mark Nord, *Migration and Economic Restructuring in Nonmetro America, 1989-94*, AGES 9615, USDA-ERS, 1996.

Glenn V. Fuguitt, "Population Trends in Sparsely Settled Areas of the United States: the Case of the Great Plains," in R E. Lonsdale and J. H. Holmes, eds., *Settlement Systems in Sparsely Populated Regions: The United States and Australia*, New York: Pergamon Press, 1981.

David A. McGranahan, *Population Loss in Remote Rural Areas*, AIB-664-70, USDA-ERS, 1993.

David A. McGranahan

Can Manufacturing Reverse Rural Great Plains Depopulation?

Manufacturing has been expanding in the rural Great Plains, more rapidly than in the rest of the rural United States, but much of the expansion has been to larger, growing places and much has been in meat packing, which tends to hire low-skill workers—a group in relatively short supply in much of the region. Manufacturers in areas of substantial population loss report problems with finding labor and, even more often, with the attractiveness of the area to managers and professionals. The rural Great Plains seems particularly suited to advanced technology manufacturing, if the problem of attracting managers and professionals could be eased. Manufacturers in the region participate heavily in government programs, but no more so than in other rural regions. Those in areas of decline have tended to receive greater support.

Nationally, natural amenities and proximity to large urban areas heavily influence rural population change, raising questions about the future of remote places with little recreation appeal (Galston and Baehler). These areas have human and community resources, however, which may be attractive to manufacturing, an important part of the rural economic base. And government programs at the Federal, State, and local levels have been geared toward developing rural manufacturing. The Great Plains, largely dependent on agriculture, generally has little prospect for a recreation-based economy. In much of the region, the land is too flat, the winters too cold, the summers too hot, and the services too sparse to appeal to many short-term visitors or retirees. What, then, are the prospects for developing a manufacturing base to stem rural depopulation? And what have governments been doing to stimulate rural manufacturing in the Great Plains?

Drawing principally on the ERS Rural Manufacturing Survey (RMS) (see box p. 41), this article investigates problems facing Great Plains manufacturers and their participation in government programs. After an overall comparison with other rural areas, these issues are examined across three dimensions within the rural Great Plains. The first is local population change, which has varied considerably across the region. Areas of substantial population loss, which typically have older and sparser populations, may be less amenable to manufacturing than areas of modest loss or gain, and may not be sharing in its expansion. Alternatively, these may be the areas receiving most government support and most attractive to manufacturers. The second dimension is technology use. One of the advantages of the rural Great Plains is its relatively well-educated labor force. Manufacturers adopting advanced technologies and production practices generally prefer more highly skilled workers (Teixeira, 1998). In the RMS national sample, these manufacturers have tended to have greater gains in employment and earnings, so their situation in the rural Great Plains is of particular concern. The third issue is the type of manufacturing, whether it involves the processing of agricultural products, particularly meat packing. Given the importance of agriculture as its economic base, the Great Plains presumably has a competitive advantage in agricultural processing. Moreover, this type of manufacturing has been receiving considerable attention in Federal if not State legislation.

David A. McGranahan is a senior economist in the Rural Business and Development Policy Branch, Food and Rural Economics Division, ERS, USDA.

Manufacturing in Rural Great Plains Has Been Expanding, Much of It in Meat Packing

The Great Plains, particularly the rural Great Plains, has relatively little manufacturing compared with the rest of the country. In 1993, only 8 percent of jobs in the rural

Great Plains were in manufacturing compared with about 18 percent in the rest of the rural United States (table 1). But while this might suggest that the rural Great Plains is unattractive to manufacturers, the number of manufacturing jobs in the rural Great Plains has expanded considerably since at least 1969, at a rate well above that of the rest of the rural United States. Although there was a substantial drop in manufacturing jobs with the recession of the early 1980's and the subsequent farm crisis, the growth rate in rural Great Plains manufacturing jobs has been about twice the rate of the rest of the rural United States since the 1986 nadir (fig. 1).

Much of the gain in manufacturing jobs has come from a shift in meat packing to the rural Great Plains. In 1984, food processing comprised 26 percent of total manufacturing wage and salary jobs in the region (table 2). About half the food processing jobs were in meat products, primarily meat packing (as opposed to sausages or poultry processing, which are not included in the meatpacking category). Between 1984 and 1995, while the rest of the food processing industries had no net gain, jobs in meat packing and related products increased by nearly two- thirds and comprised a major part of the new jobs. The growth in meat packing, like most of rural manufacturing growth, represented a movement from urban to rural areas. Nationally, wage and salary employment in meat packing was essentially the same in 1995 as it had been in 1984, although jobs in poultry processing, another meat products category, increased substantially (BLS Internet Data Files).

Table 1

Proportion employed in manufacturing,1993

The rural Great Plains has relatively little manufacturing

Area type	Great Plains	Rest of United States
	Percent	
Total	8.9	13.5
Urban (metro)	9.3	12.7
Rural (nonmetro)	8.3	17.7

Source: ERS analysis based on data from the Bureau of Economic Analysis, U.S. Department of Commerce.

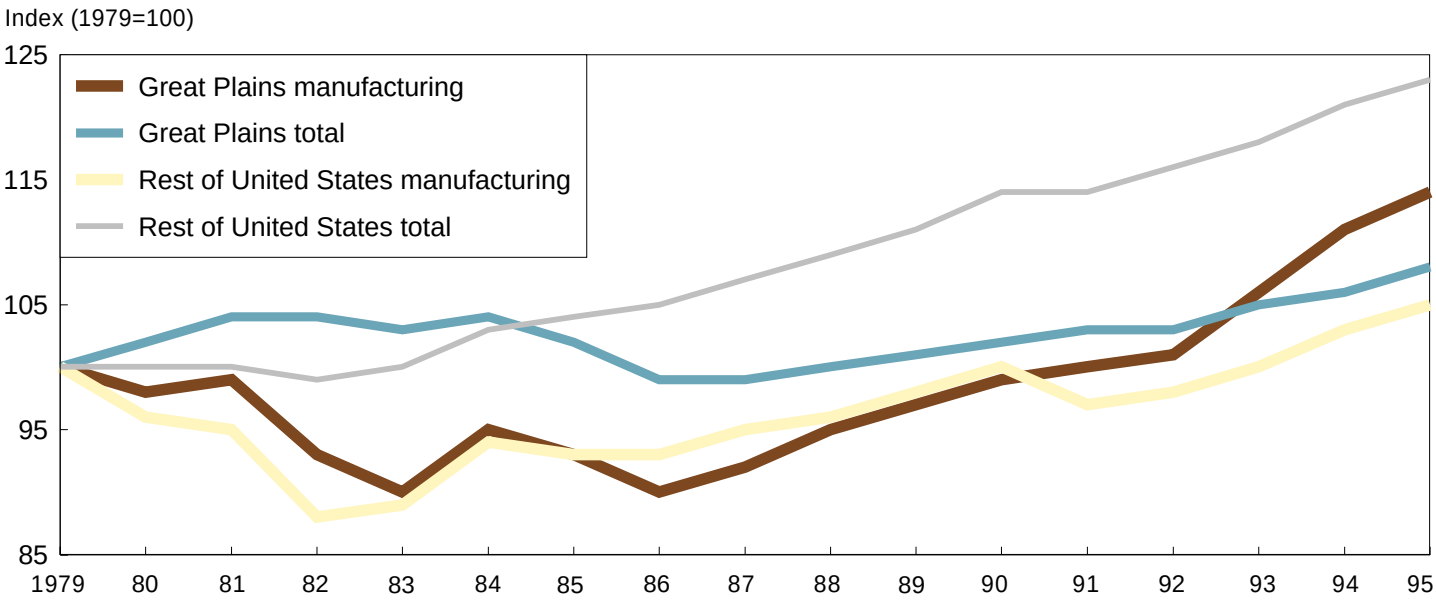
Highly concentrated in a few locations, meat packing in the rural Great Plains is an industry apart. In 1995, over 90 percent of meatpacking wage and salary workers were in 12 counties across three States and, while the rest of the rural Great Plains had a net loss in meatpacking jobs between 1984 and 1995, these 12 counties had a gain of 88 percent. Apart from these 12 meatpacking counties, manufacturing in the region has become slightly more dispersed since 1979. The meatpacking industry also differs sharply from the rest of Great Plains manufacturing in terms of plant size and workforce characteristics, as discussed below.

The meat products sector was not the only sector to expand from 1984 to 1995. Manufacturing in wood-related industries (wood products, furniture, and paper) grew by 49 percent, and manufacturing in nonresource-related industries (fabricated metal products, machinery, transportation, instruments, and miscellaneous) expanded by

Figure 1

Average annual rural employment, 1979-95

Rural manufacturing has grown rapidly in the Great Plains since 1986



Source: ERS analysis based on Bureau of Economic Analysis county data.

32 percent. This last set of industries together added more jobs than agricultural and wood products combined. Although some of these industries may supply the agricultural sector, new manufacturing in the rural Great Plains is not locating there simply or perhaps even primarily because of natural resources.

Labor a Key Problem Facing Rural Manufacturers in the Great Plains

A principal aim of the ERS Rural Manufacturing Survey was to learn what the manufacturers themselves see as the major local problems inhibiting their ability to compete. We examined five general areas: human resources, transportation infrastructure, access to suppliers and customers, physical plant, and government. The first three are particularly relevant, given the development of new manufacturing technologies and the globalization of markets during the past decade.

The factor reported most often as a major problem by manufacturers in the rural Great Plains was the quality of available labor (table 3). This is true of rural (and urban) areas in general, so the Great Plains does not stand out in this regard (McGranahan, 1998). However, where in many rural regions the question is primarily one of quality, given both the high education levels and the sparseness of the Great Plains population, the problem there may be more one of availability. One indication is that manufacturers see the quality of local schools as a major problem much more rarely in the Great Plains than elsewhere. This question will be revisited in the discussion of advanced-technology manufacturers.

The second most cited problem is the attractiveness of the area to managers and professionals. This problem is cited twice as often in the Great Plains as in rural areas in general. One reason may be quality of life in sparsely settled areas, particularly those with declining populations. The lack of local services may make the rural Plains less attractive than other rural areas. Another reason may be that the scarcity of local jobs makes living in the area relatively difficult for dual-career households. A third possibility, that the Great Plains has a relatively harsh climate, does not appear to be relevant. None of the 50 manufacturers surveyed in the urban Great Plains reported the attractiveness of the area to managers and professionals to be a major problem. Difficulty in attracting skilled managers and professionals could be a major drawback for rural Great Plains manufacturing as the effective adoption of new technologies and work organization methods typically requires a skilled managerial and professional core.

Access to airport facilities and, to a lesser extent, access to railroads were also more likely to be reported as major problems in the Great Plains than elsewhere. While the problem with airports is widespread—over half the Great Plains sample reported this as at least a minor problem—the railroad issue applies to relatively few establishments. Only 26 percent reported this as even a minor problem.

Despite the distance to airports and the remoteness of the Great Plains from major manufacturing centers, only 10 percent of the respondents reported major problems of access to any of their suppliers and customers. However, problems associated with access to equipment suppliers are reported significantly more often in the Great Plains than in the rest of the rural United States, another suggestion that advanced technology users, for whom this access is generally most critical, may face particular problems in the Great Plains.

Complying with environmental regulations was reported by about 20 percent of the Great Plains manufacturers as a major problem. Although quite substantial, this, like labor, is no more an issue in the Great Plains than in rural areas in general. While State and local taxes were felt to be at least a minor problem by over half the Great Plains manufacturers and a major problem by 15 percent, this is lower than in other rural regions and makes the Great Plains relatively attractive in this regard.

Table 2

Changes in manufacturing wage and salary jobs in the rural Great Plains, 1984-95*

Meatpacking is a major source of new jobs, but most new manufacturing jobs come from outside the food processing sector

Industry type	Annual average number of jobs				
	1984	1995		Change,1984-95	
	1,000's		Percent	1,000's	Percent
Food processing	41	56	28.8	15	35.9
Meat products	22	37	19.2	15	65.9
Meatpacking	20	32	16.6	12	62.1
Other food processing	19	19	9.7	0	0
Nonfood manufacturing	120	138	71.2	18	15.4
Total	161	194	100.0	33	20.6

*Data exclude Wyoming (see box p. 41).

Source: Calculated by ERS from BLS data files.

Table 3

Rural Great Plains manufacturers report on local problems in their establishment's ability to compete

Human resource, environmental, and transportation issues stand out

Local factors	Great Plains		Other rural United States
	Any problem	Major problem	Major problem
		Percent	
Human resources:			
Quality of available local labor	79.4	30.4	34.5
Attractiveness to managers, professionals	60.8	**28.3**	14.0
Access to training courses	45.7	7.8	9.0
Local cost of labor	32.3	3.9	7.5
Quality of primary and secondary schools	28.5	**1.1**	10.7
Local management-labor relations	29.9	0	3.9
Transportation infrastructure:			
Access to airport facilities and services	52.7	**16.4**	8.4
Railroad access	26.1	**10.1**	6.1
Interstates and major highways	25.1	6.4	6.9
Local roads and bridges	25.4	4.0	5.7
Access to suppliers and customers:			
Access to equipment suppliers	50.2	9.9	4.7
Access to material suppliers	48.6	9.9	6.3
Access to major customers	43.9	9.7	6.1
Access to market information	34.9	5.3	5.3
Access to financial institutions	27.7	3.6	4.2
Access to business services	24.7	2.7	1.3
Physical plant:			
Water and sewer systems	32.7	8.9	7.8
Cost of facilities and land	37.2	5.0	8.4
Government:			
Environmental regulations	56.3	19.5	21.6
State and local tax rates	58.2	**15.2**	22.8

Note: Differences from rest of rural United States significant at 0.05 level are in bold.
Source: ERS Rural Manufacturing Survey, 1996.

These survey results do not immediately reveal why manufacturing is expanding more in the Great Plains than in rural areas in general. Great Plains manufacturers report fewer problems with State and local taxes than others do, but the differences do not seem substantial enough to comprise an explanation.

They also appear to have somewhat fewer problems with labor quality than other rural manufacturers. Only the extremely low reporting of problems with school quality is significantly different from the rest of the rural United States. According to statistical tests, all human resource problems referring to production workers were consistently reported less often in the Great Plains than elsewhere.

There are reasons to expect that labor quality is an asset of the Great Plains. While there are some local exceptions, such as parts of the Texas Plains with substantial Hispanic populations, the levels of education in the rural Great Plains are generally high, despite decades of outmigration. Compared with their rural counterparts elsewhere, a relatively low proportion of the young working-age people in the rural Great Plains lack a high school diploma and a relatively high proportion have a college degree (table 4). With slow growth in other kinds of jobs in the Great Plains, manufacturing may have relatively little competition for more educated labor compared with manufacturing in other rural areas. Even with these relatively high area education levels, RMS data show that plant hourly wages are lower than the rural average in the Great Plains—if not as low as in the South.

Government Program Participation Is High, but No Higher Than in the Rest of the Rural United States

One potential explanation for the relatively high rate of growth in manufacturing in the rural Great Plains is greater government assistance in the Great Plains than elsewhere. The RMS asked about participation over the previous 3 years in potential credit assistance, tax breaks, industrial parks/enterprise zones, and worker training/technology assistance. The level of participation reported by rural Great Plains manufacturers was high, particularly when measured according to plant employment. Over 60 percent of the plants had received some form of assistance and over 75 percent of the employment in manufacturing plants was in plants that had received assistance (table 5). (The latter proportion is higher because larger plants are more likely to participate in programs.)

The most frequent form of assistance was tax breaks from State and local governments. Nearly half of the manufacturers reported receiving tax breaks. These plants employed two-thirds of the workforce in the sample. In addition, nearly a quarter of the manufacturers had received credit assistance and the same proportion worker training or technology assistance. Finally, nearly 20 percent benefited from industrial parks or enterprise zones.

Despite these high levels of participation, rural Great Plains manufacturers were generally no more likely to benefit from government programs than manufacturers in the rest of the rural United States. The only substantial difference is in employment in plants receiving direct government loans, where the proportion is much higher in the Great Plains (29 percent) than elsewhere (13 percent). Since the proportion of plants benefiting from loans is the same in the Great Plains as elsewhere, the basic difference is that these loans are more concentrated among large plants in the Great Plains. In general, direct assistance to manufacturers is not a reason that manufacturing is growing more rapidly in the rural Great Plains than in the rest of rural America.

Table 4

Education completed by rural population, ages 25-44, 1990

Rural Great Plains young working-age population has relatively high education levels

Education	Great Plains	Rest of United States
	Percent	
No H.S. diploma	14.2	18.7
H.S. diploma	67.5	66.0
B.A./B.S. degree	18.3	15.3
Total	100.0	100.0

Source: ERS based on data from the 1990 Census of Population (Bureau of the Census).

Manufacturing and Population Change

As the rural Great Plains population has declined, it has become less dispersed. From 1980 through the mid-1990's, the more rural a Great Plains county—the more remote from a metro area and the smaller the size of its towns—the more likely it was to lose population. Over 60 percent of the 423 counties in the rural Great Plains lost a substantial proportion of their population (over 8 percent) between 1980 and 1996. Of the 208 rural counties not adjacent to a metro area and lacking a town of at least 2,500 residents, nearly 80 percent had a substantial population loss. Although the rural Great Plains population was stable during the 1990-96 period, three out of every four of these completely rural counties continued to lose population. At the same time, having a substantial town has not guaranteed a stable population. Over half of the nonadjacent counties with cities of 10,000 or more lost population in 1980-96, with one in seven having losses of over 8 percent.

Population change has been related to change in manufacturing jobs in the rural Great Plains, but the nature of this relationship has been complex. Manufacturing jobs have grown in counties with expanding populations, and undoubtedly contributed to that expansion (fig. 2). But the correlation between the rate of population change, 1980-96, and change in manufacturing jobs, 1979-93 (expressed as change in jobs divided by the county employment in 1979), was only 0.21. One reason for the low correlation is that change in manufacturing has had little bearing on population change in remote, completely rural counties, which have almost uniformly had a substantial population loss (fig. 3). Their economies are generally too porous to be greatly affected by changes in their manufacturing jobs and have been largely overwhelmed by the loss of agricultural jobs. The correlation between changes in manufacturing and population was strongest among rural counties with cities of at least 10,000 residents. In these counties, every gain in a manufacturing job (per 100 total jobs in 1979) was associated with a 1.4-percent gain in population. Even here, however, one cannot assume that manufacturing is responsible for the gains in population. To some extent, people and manufacturers may be drawn to the same types of locations—ones with airports, hospitals, and other amenities, for instance. Indeed, population loss itself may discourage some manufacturers, given its impact on the age structure and its stress on local services.

The manufacturing survey results suggest that human resource problems are much greater in areas of substantial population loss than in other Great Plains counties. In counties with a loss of at least 8 percent of their population during 1980-96, 44 percent of the manufacturers reported a major problem with the quality of available labor (table 6). What may be equally significant in an era

Table 5

Rural manufacturer participation in government programs*

Great Plains programs are little different than rest of rural United States

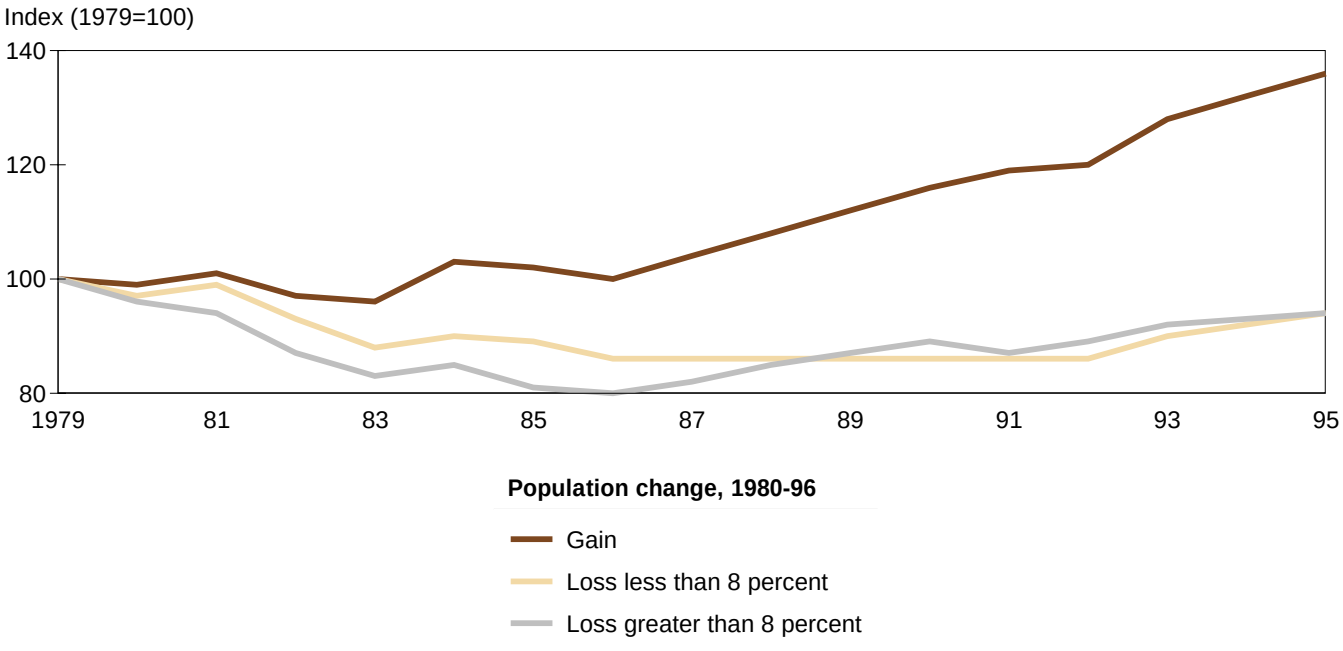
Type of program	By plant		By employment	
	Great Plains	Rest of United States	Great Plains	Rest of United States
	Percent			
Any of government programs below	61.9	62.6	78.1	78.5
Tax breaks by State or local government	46.2	46.5	65.6	65.6
Credit programs:				
Direct loans from a government agency	14.6	15.0	28.5	12.8
Government insurance or guaranteed loans	14.3	13.0	12.2	10.2
Revolving loan funds operated by a nonprofit organization	9.9	9.2	5.5	6.1
Any of above	23.5	23.3	35.0	18.1
Worker training programs or technology assistance programs	23.2	29.5	49.8	48.0
Industrial parks or enterprise zones	18.8	21.0	28.9	27.8

*Proportion reporting programs to have been somewhat or very important for their business's operations in the past 3 years.
Source: ERS Rural Manufacturing Survey, 1996.

Figure 2

Rural Great Plains manufacturing employment, 1979-95

The fastest manufacturing employment growth has been in counties with rising population

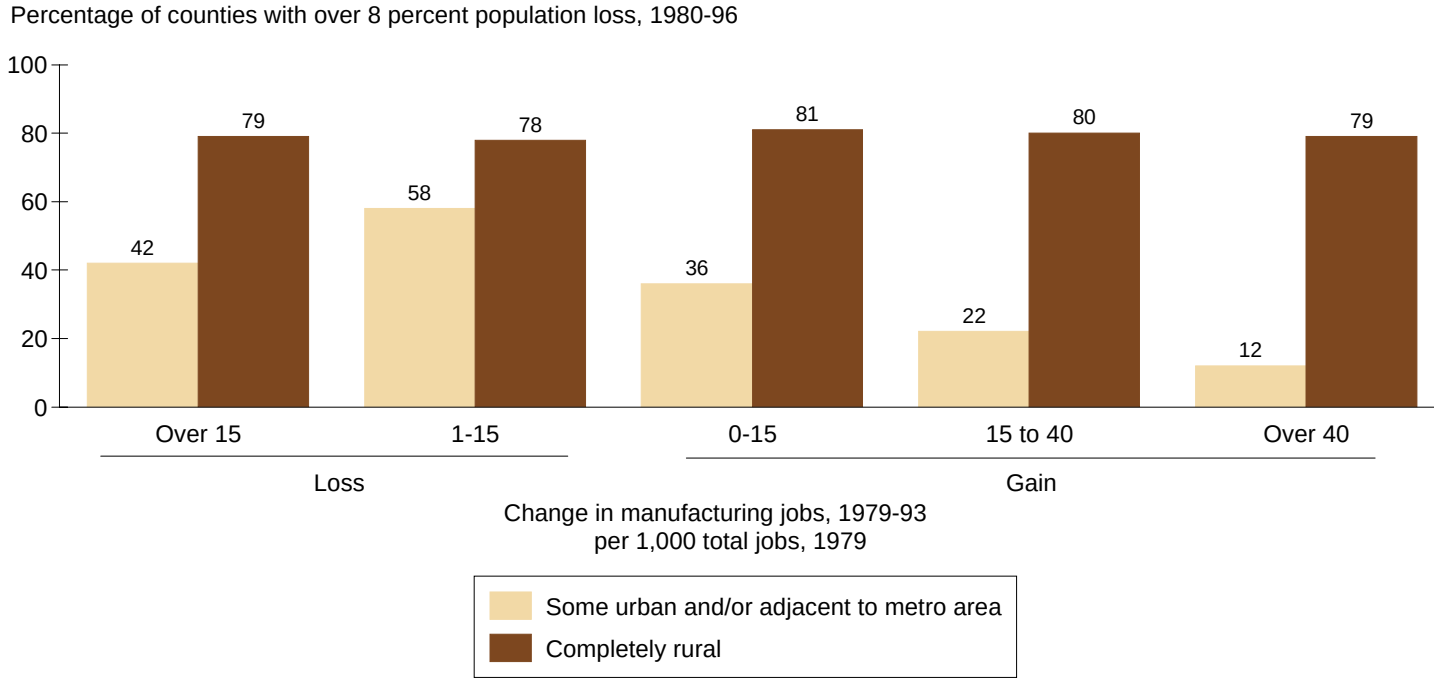


Source: ERS analysis based on data from Bureaus of Economic Analysis and Labor Statistics.

of intense competition and restructuring, nearly half the manufacturers in heavy population-loss counties reported that the attractiveness of the area to managers and professionals was a major problem for their ability to compete. Both of these statistics are much higher than found in counties with either a lower loss or a gain in population during 1980-96. Manufacturers in other rural counties with substantial population loss (20 percent of the sample) reported labor and attractiveness problems with even greater frequency than manufacturers in completely rural areas.

Although the differences were not statistically significant, manufacturers in counties with heavy population loss also tended to report more problems with environmental regulations. The manufacturing in these counties is not more concentrated in the types of industries that typically have these problems, so the problem may lie more in the ability

Figure 3
County change in manufacturing jobs and population loss
Manufacturing growth is unrelated to population loss in completely rural counties



Source: ERS analysis based on Bureau of Economic Analysis data.

of local infrastructure to deal with environmental problems. At the same time, these manufacturers reported fewer problems with State and local taxes (although, again, the differences were not large enough to be statistically significant).

The only other statistically significant difference related to access to financial institutions (not shown), which 9 percent of the manufacturers in the heavy population-loss counties reported as a major problem compared with less than 1 percent in the gaining counties. While this could reflect relative prospects for manufacturing in the population-loss counties, it could also indicate that financial institutions in these counties are more constrained.

Conditions of population loss, which have been long-term over a substantial part of the rural Great Plains, have created a "vicious circle." People leave an area because of a lack of jobs while at the same time manufacturers and other employers may avoid the area because of a lack of available people. The high proportion of manufacturers reporting the attractiveness of the area for managers and professionals to be a major problem seems likely to represent an issue that goes well beyond manufacturing to other industries and even civic affairs. An area that cannot develop an adequate managerial/professional base in an era of high technology may have difficulties no matter what kinds of special development programs are in place.

The Rural Manufacturing Survey and Other Data Sources

The data for this article are from three major sources. The first is the 1996 ERS Rural Manufacturing Study, designed to identify problems facing rural manufacturers and programs needed to enhance rural competitiveness. The telephone survey, carried out by Washington State University, included 159 respondents from the rural Great Plains out of a total completed sample of 3,900 manufacturing plants with 10 or more employees. The other two data sources are county-level data, one with information on employment by major industries for 1979-86 and 1990-93 from the Bureau of Economic Analysis (U.S. Department of Commerce) and the other with detailed industry information from the Bureau of Labor Statistics (U.S. Department of Labor) (BLS) for 1984 and 1995. These industry data were not available for rural Wyoming.

Technology Adoption

Establishments that have adopted advanced technology are typically the more effective firms in our study, with better educated workers, higher wages, and greater gains in employment and wages over the previous 3 years. They also tend to have greater needs for skilled workers—although the Great Plains meatpacking firms, generally users of advanced technology, are a major exception.

Table 6

Major local problems reported by rural manufacturers and county population change

Human resource problems are much greater in counties with substantial population loss

	Population change, 1980-95		
	Loss		
Local factor*	Over 8%	Under 8%	None or gain
		Percent	
Quality of available local labor	**43.9**	**17.1**	**31.6**
Attractiveness of area to managers and professionals	**49.1**	**31.6**	**9.7**
Environmental regulations	27.7	18.9	13.8
Access to airport facilities and services	**18.5**	**5.2**	**24.5**
State and local tax rates	8.9	15.7	19.4
		Number	
Number of establishments	**45**	**52**	61

Note: Differences across categories significant at 0.05 level are in bold.
*Ordered by proportion of rural Great Plains respondents indicating factor is a major problem.
Source: ERS Rural Manufacturing Survey, 1996.

Rural advanced technology users typically report more problems with human resources—the quality of available local labor, the attractiveness of the area for managers and professionals, the quality of local schools, and access to training (McGranahan). In the Great Plains, the pattern appears to be markedly different, although the number of advanced technology firms in the sample—26—is so small that even though the results reported here are statistically significant, the magnitude of the differences must be seen as subject to a wide range of error.

In contrast to the general pattern, the low-adoption manufacturers report the most problems with the quality of available labor in the Great Plains, about twice as often as advanced technology users (table 7). This is consistent with the earlier suggestion that the lack of labor for production jobs rather than the quality of labor seems to be the principal issue in the Great Plains. Moreover, advanced technology manufacturers seem considerably more satisfied with their labor quality in the rural Great Plains than elsewhere as they are only half as likely to cite it as a major problem. A final indication of labor quality is that none of the advanced technology users reported major problems with the quality of local schools (versus 17 percent elsewhere).

At the same time, the ability to find managers and professionals appears to be a more substantial problem in the rural Great Plains than in the rest of the rural United States at all levels of technology adoption, but particularly for those using advanced technologies. These manufacturers report major problems with the attractiveness of the area twice as often as they report labor quality problems, the reverse of the pattern found in other rural regions.

Advanced technology users in the Great Plains also report more problems with access to machinery and equipment suppliers (25 percent) than advanced technology users in other regions, suggesting that remoteness from industrial regions is a drawback for those wanting to adopt the latest technologies. Like advanced technology users in other regions, they are no more likely than others to report a lack of access to financial capital.

In the national rural sample, the larger the plant and the more advanced the use of technology, the greater the participation in government programs. While program participation may facilitate technology adoption, it seems most likely that the primary dynamic is that effective management leads to both faster adoption of new technology and greater ability to garner government support. In the rural Great Plains, however, this pattern does not hold—technology use is unrelated to program participation (table 8). In effect, low technology users benefit more from government programs (credit assistance and industrial parks, in particular) in the rural Great Plains than elsewhere in the country. This result is somewhat puzzling since low adopters of new technology are not more likely to be located in counties with low education levels or population loss.

Food Processors

Food processing, particularly meat packing, has been a substantial and growing part of manufacturing in the rural Great Plains. Only seven (5 percent) of the rural

Table 7

Major problems reported by rural manufacturers, by level of technology adoption

High local labor quality is an advantage to Great Plains new technology users, but this is accompanied by problems in access to airports and equipment suppliers and, especially, the attractiveness of the area to managers and professionals

	Great Plains:			Other rural United States:		
	Level of adoption of new technologies and work organization*			Level of adoption of new technologies and work organization**		
Local factor	High N=26	Middle N=86	Low N=38	High N=548	Middle N=1317	Low N=645
	Percent					
Quality of available local labor	18.9	30.2	**42.7**	**39**	34	32
Attractiveness to managers, professionals	**47.9**	26.2	23.6	**18**	**14**	**10**
Access to airport facilities and services	**30.5**	11.3	21.5	**13**	8	**5**
Access to equipment suppliers	**24.6**	8.6	4.5	**7**	5	4
Quality of primary and secondary schools	0	2.0	0	**17**	**10**	7

*Differences across technology categories significant at 0.05 level are in bold.
**Differences for technology level between Great Plains and other rural United States significant at 0.05 level.
Source: ERS Rural Manufacturing Survey, 1996.

Great Plains sample plants in the RMS were meat packers, but they are markedly different from other plants in the region. They are larger; most employ over 1,000 workers, while only one other plant in the rural Great Plains sample was that large. In most of these plants, fewer than half the production workers have a high school degree. Only 4 percent of the remaining plants have as low a proportion of high school graduates. Similarly, while almost all the meat packing plants have workforces that are over 50 percent minority, less than 10 percent of the other plants reach that level. Despite the small size of the sample, these three differences are all statistically significant. All of the meatpacking plants in the survey with over 100 employees are branch plants of larger firms.

The meatpacking plants employ a sufficient proportion of the RMS sample workforce to significantly affect some of the workforce statistics. For instance, while production worker education levels are otherwise relatively high in the Great Plains—reflecting the high educational levels in the working-age population—well over half the workers in meat packing have less than a high school education and relatively few have at least 1 year of college (table 9). Despite these low education levels, hourly earnings are generally not lower in meat packing than other industries, probably because of the nature of the work. The two plants that did not rely on low-education workers paid substantially higher than average wages.

Despite their uniqueness in the rural Great Plains setting, meat packers did not stand out in terms of the local problems they reported (although, with such a small sample, almost all would have had to report one or another problem or program). Most reported receiving tax breaks and assistance in worker training. Since almost half of the other plants in the rural Great Plains (and most of the branch plants) also reported tax breaks, it is only clear that meat packers are not disadvantaged in terms of government program benefits.

Table 8

Rural plant participation in any government program in past 3 years, by technology level

In Great Plains, low adopters just as likely to benefit as high adopters

Level of technology adoption	Great Plains	Outside of Great Plains
	Percent	
Low	**62.2**	48.1
Middle	60.5	64.3
High	65.3	76.0

Note: Significant differences from outside Great Plains are in bold.
Source: ERS Rural Manufacturing Survey, 1996.

Other food processors in the region resemble the meat packers less in their size and work force characteristics than they do other manufacturers. In general, these food processors report local barriers to competitiveness similar to other manufacturers, with three interrelated (and statistically significant) exceptions. They were more likely to report as major problems environmental regulations (43

Table 9

Average education levels of production workers in Great Plains and other rural plants

Except in meat packing, rural Great Plains workers have relatively high education

Education completed	Rest of rural United States	Total	Rural Great Plains: Food processing: Meat-packing	Rural Great Plains: Food processing: Other	Rural Great Plains: Nonfood
			Percent		
No HS diploma	19.7	27.1	58.6	15.9	12.6
HS diploma	67.9	60.5	36.5	67.5	71.2
Further schooling	12.4	12.4	4.9	16.6	16.1
Total	100.0	100.0	100.0	100.0	100.0

Source: ERS Rural Manufacturing Survey, 1996.

percent), water and sewer systems (27 percent), and the cost of land and facilities (17 percent). None of the meat packers cited environmental regulations as a major problem. This difference, although not as stark, is also found in the rest of rural America outside of the Great Plains. With respect to government program participation, food processors were generally like other manufacturers, except that nearly two-thirds reported receiving tax breaks. Also, perhaps because of the low skills involved, with meat packers the exception, they rarely took advantage of government training programs.

The Future of Great Plains Manufacturing

What are the prospects for developing a manufacturing base in the Great Plains to stem rural depopulation, and what have government programs been doing to stimulate this development? This study provides no definitive answers, but some clues.

Manufacturing has been expanding in the rural Great Plains, much more rapidly than in the rest of the rural United States. However, while emphasis is given to agricultural value-added production, most new manufacturing jobs between 1984 and 1995 were in activities that did not draw on agriculture (or wood). In fact, outside of meat packing and related activities, food processing has not been generating jobs in the rural Great Plains. Particularly given the high education levels in much of the Great Plains relative to the rest of the country, it would be a mistake to focus on value-added production, which tends not to require skilled workers.

While manufacturing has been expanding in the rural Great Plains, it may do relatively little to relieve problems of population decline. First, much of the expansion has been in meat packing, which is highly concentrated in a few counties and takes no advantage of the relatively high workforce education levels in much of the region. Second, population change in the Great Plains has been uneven. While areas of population growth have gained considerable manufacturing, the reverse is not always true. Small counties tend to be overwhelmed by other change, particularly the loss of agricultural employment. Lacking major service activities, these local economies appear largely unable to take advantage of new income coming into the community. To some extent, the problem in smaller counties may be less the generation of new economic base activities than the loss of service center functions to larger centers. This is not to say that new manufacturing is not important to the local region. Rather, the jobs generated as the money circulates may not be in the same place as the plant.

Finally, there is some evidence, particularly from the RMS, that manufacturers are not attracted to counties with substantial population decline, whether this is for the same reasons that the population has been leaving or because people have been leaving. Manufacturers in counties that have had substantial decline in the past 15 years are much more likely than others to report the attractiveness of the area to managers and professionals as a major problem for their businesses. They are also more likely to report problems with the quality of available labor and access to financial institutions.

Most manufacturers report benefiting in the past 3 years from State and local tax breaks, government credit programs, industrial parks, and/or training assistance. This is true in the rest of the rural United States as well, suggesting that smokestack chasing has not gone out of style. In the Great Plains as elsewhere, branch plants are more likely to report tax breaks than single-unit firms. However, there is evidence of an at least de facto regional policy in the rural Great Plains, as manufacturers in counties with substantial population decline are more likely than others to have received assistance.

The attractiveness of the area to managers and professionals is the local factor most often reported as a major problem by both advanced technology users and manufacturers in counties with substantial population loss. Except in relation to local school quality, the issue of the ability to attract managers and professionals to an area has received little research attention, so it is difficult to judge its salience in manufacturer decisionmaking. But the future development of advanced technology manufacturing, particularly in areas of population decline, is important for the rural Great Plains. The general ability to attract and keep effective managers and professionals, who often become the new local entrepreneurs in any industry, may be the most significant barrier to widespread economic development in the rural Great Plains.

For Further Reading . . .

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Donald J. Adamchak, Leonard E. Bloomquist, Kent Bausman, Rashida Qureshi

Retail/Wholesale Trade Employment Directly Related to Population Change in the Nonmetro Great Plains

During 1950-90, the nonmetro civilian labor force declined except during the 1970's. In the 1970's, nonmetro manufacturing increased substantially, and the baby boom generation entered the labor force. By contrast, the retail/wholesale labor force increased in every decade except for the 1980's. Several factors could have contributed to the decline in the retail/wholesale labor force, including population decline and the effects of large retail establishments.

The nonmetro counties of the Great Plains experienced almost uniform outmigration throughout the 20th century, more so than all other subregions of the United States except the Corn Belt and the Mississippi Delta. Due to the outmigration of mostly young people, natural decrease (more deaths than births in a given year) occurred in this subregion, with more counties experiencing natural decrease resulting from people moving away after World War II. Heavy rural population losses were commonplace in the Great Plains from Texas to Nebraska during the 1950's and 1960's (Beale, 1969). After a rebound in the 1970's, nonmetro population decline in the 1980's was pervasive in the Great Plains, Corn Belt, and the Mississippi Delta, and natural decrease counties were concentrated in the Great Plains, Corn Belt, and eastern Texas (Johnson).

For nonmetro America as a whole, the 1990's have been a time of population growth. Between 1990 and 1996, 75 percent of nonmetro counties gained population compared with only 45 percent during the 1980's. Net inmigration accounted for 61 percent of the increase during 1990-96, and counties were widely distributed geographically (Johnson and Beale). However, in the Great Plains, west Texas, and the Mississippi Delta, net inmigration was less prevalent, with natural decrease still occurring in the Great Plains and west Texas. Clearly, population stagnation and loss has been significant in the Great Plains relative to most other subregions of the country.

Most studies investigating population change specify other variables as determinants of population change. We focus instead on the consequences of population change for employment in the local retail and wholesale trade sectors of the nonmetro Great Plains. Population change affects most functions of a community, and population decline usually has a negative impact on community functions. This focus is particularly relevant for a study of the Great Plains because, in contrast to manufacturing and the steady decline in agricultural employment, the retail/wholesale trade sector has been a major source of employment for nonmetro residents of the region since World War II. Nearly 20 percent of employed persons in the region were employed in this sector in each decade between 1950 and 1990. Moreover, one would expect employment in the retail/wholesale sector to be sensitive to population change, given its dependence on the consumption demands of the population it serves.

Population Change Affects Retail, Wholesale

Retail/wholesale trade in rural America has attracted considerable interest in recent years. Kenneth Johnson suggested that, during the 1970's, the decline in rural retail

Donald J. Adamchak is a professor of Sociology at Kansas State University; Leonard E. Bloomquist is an associate professor of Sociology and director of the Population Research Laboratory at Kansas State University; Kent Bausman and Rashida Qureshi are graduate research assistants at Kansas State University.

sales was apparently more a matter of stagnation than decline. He noted that the numbers on rural retail sales might be inflated to some degree because of the slight population boom in rural areas in that decade. The number of rural retail establishments also declined, particularly those establishments that dealt more in bulk and luxury goods.

Tim Knapp noted that, during the 1980's, the combined effects of a decline in nonmetro manufacturing and the farm crisis prompted an exodus of the rural population. Recent research suggests that population loss has been detrimental to rural retail and wholesale trade by reducing local demand for consumer goods. In Nebraska, retail sales fell the least in rural counties with lower levels of population decrease and higher per capita incomes and situated the farthest from regional trade centers (Yanagida and others).

We seek to extend previous research on the relationship between population change and retail/wholesale trade in two ways. First, we analyze the relationship among counties in a region where population has declined for an extended period of time. Focusing on the rural Great Plains allows us to assess the negative effects of long-term population decline on an employment sector that is an important indicator of community viability. Second, we extend the time period used to analyze the relationship between population decline and retail/wholesale employment changes. By examining the effects of population change on retail/wholesale employment in each of the four decades between 1950 and 1990, we have found significant variations over time.

Nonmetro Population Declines Over Four Decades

Overall, the nonmetro population of the Great Plains declined 5.8 percent, approximately 256,600, from 1950 to 1990. Of the four decades being examined, the 1950's was a stable decade with a 0.2-percent increase in population. The region benefited from the population turnaround of the 1970's with a 5.2-percent increase. However, surrounding the modest growth of the 1970's were two decline decades. The 1960's witnessed a 6.2-percent decline and the 1980's a 4.7-percent decline (table 1). The last three decades have been rather unstable with regard to population change.

The bottom panel of table 1 shows percentage population change at the county level, which is a better indicator of how widespread population loss has been. When all counties are averaged together, they experienced a 13.6-percent population loss during 1950-90. There was a small average loss of 2.5 percent during the 1950's, followed by a large loss of 9.1 percent during the 1960's. The 1970's witnessed a small increase of 2.1 percent, benefiting from the population turnaround. However, the 1980's were similar to the 1960's as the county population again declined 8.1 percent, and more nonmetro counties lost population during this decade than the other three decades in this analysis (84 percent).

The three types of nonmetro counties of the Great Plains show some interesting patterns. Counties adjacent to metro areas had a pattern similar to the region but had greater population increase during the 1970's and less decline in the 1980's (see "Data and Definitions," p. 51). However, 77 percent of these counties still lost population during the 1980's. Urban nonadjacent counties gained 7.8 and 7.4 percent during the 1950's and 1970's, respectively. During the 1960's, this group lost only 3.1 percent of its population, but it lost 5.1 percent in the 1980's, with 75 percent of the counties suffering losses during this decade. Overall, urban nonadjacent was the only county type that increased in population over the four decades (10.3 percent).

Population declined the most in completely rural nonadjacent counties. Declines were recorded for each of the four decades including the 1970's. Population declines for the region and for counties were fairly consistent. Only the turnaround decade of the 1970's saw a lessening of decline to 3.7 percent for completely rural counties. During the 1980's, 94 percent of these counties (200 of 213) lost population. Over the four decades, completely rural nonadjacent counties lost about one-third of their population, dropping from approximately 1.25 million to 819,000.

These counties have experienced consistent age-selective net outmigration for decades; that is, the young and more educated migrated from rural to urban areas. This resulted in an older age structure, and eventually a number of these counties became natural decrease counties. In 1990, 19.3 percent of the population of completely rural nonadjacent counties was aged 65 and over, compared with 16.2 and 15.9 percent for adjacent and urban nonadjacent counties, respectively.

Labor Force and Retail/Wholesale Employment

The civilian labor force experienced three decades of modest decline during the 1950's, 1960's, and 1980's (top panel of table 2). However, it increased 19 percent during the 1970's, a decade of increased manufacturing employment. Employment opportunities were created directly, but also through multiplier effects. The civilian labor force expanded as the baby boom generation, born between 1946 and 1964, reached age 18 (typical labor force age of entry) between 1964 and 1982. This surge in the labor force parallels the U.S. employment trend, where the 1970's had the largest increase (nearly 31 percent) in the five decades from 1950 to 2000. In addition, the civilian labor force in the 11 Great Plains States overall increased from 31.1 percent in Nebraska to 71.0 percent in Colorado

Table 1

Nonmetro Great Plains population change, 1950-90

Decade-by-decade fluctuations led to overall population decline, especially in the most rural counties

Item	Total Nonmetro N=438	Adjacent N=87	Urban nonadjacent N=138	Completely rural nonadjacent N=213
		Percent		
Share of nonmetro population (region):				
1950	100.0	26.3	45.9	27.8
1960	100.0	25.5	49.9	24.5
1970	100.0	25.3	51.9	22.8
1980	100.0	26.2	53.0	20.8
1990	100.0	26.4	54.1	19.5
Population change (region):				
1950-60	.2	-2.7	9.0	-11.5
1960-70	-6.2	-6.9	-2.5	-12.9
1970-80	5.2	8.8	7.5	-4.0
1980-90	-4.7	-4.1	-2.7	-10.8
1950-90	-5.8	-5.5	11.2	-34.0
Population change (county):*				
1950-60	-2.5(69)	-0.4(63)	7.8(44)	-10.1(88)
1960-70	-9.1(82)	-9.0(83	-3.1(66)	-13.0(92)
1970-80	2.1(53)	7.9(32)	7.4(34)	-3.7(75)
1980-90	-8.1(84)	-5.3(77)	-5.1(75)	-11.2(94)
1950-90	-13.6(74)	-5.4(68)	10.3(48)	-32.4(92)

* Numbers in parentheses are the percentage of counties with a decade of population loss.
Source: Bureau of the Census, County and City Data Book, merged files, 1947-94.

between 1970 and 1980. The age-selective net outmigration of the 1970's in the nonmetro Great Plains was counterbalanced by higher manufacturing employment and the coming of age of the baby boom generation, which contributed to growth of the civilian labor force.

During the 1970's, all three county types increased their civilian labor force as well. For the region, the adjacent and urban nonadjacent county labor force increased by between 21 and 22 percent. Even in completely rural nonadjacent counties, the labor force increased 9.1 percent while population declined 4 percent. For the other three decades, however, the labor force declined for adjacent counties and completely rural counties. Urban nonadjacent counties increased modestly during the 1950's and 1960's and slightly declined during the 1980's.

County-level declines in labor force were generally greater than at the regional level (second panel of table 2). This indicates a degree of concentration; that is, a small number of counties had large labor force increases.

Percentage change in the retail/wholesale labor force for the region does not follow the pattern of change (either direction or magnitude) in the civilian labor force or in the population for the 1950's and 1960's. Overall, the retail/wholesale labor force increased while the civilian labor force and population decreased during the 1950's and 1960's. For the 1970's and 1980's, the pattern was more consistent. Generally, during the 1970's, population, civilian labor force, and retail/wholesale employment all increased but the opposite was true for the 1980's. Furthermore, a larger number of counties (56 percent) experienced retail/wholesale employment loss during the 1980's.

County changes in the retail/wholesale labor force are somewhat different than the regional (aggregate individual) values. A few counties tend to dominate overall patterns. For the total nonmetro counties in the 1980's, there was an 8.3-percent average increase in retail/wholesale labor force, but a 3.8-percent median loss. This indicates that a small number of counties with large increases are contributing to the overall mean increase in retail/wholesale labor force. Population growth is associated with increased retail/wholesale sector employment. This is evident from the bottom two panels of table 2, where the retail/wholesale labor force declined 1.3 percent for the region during the 1980's, the only decade decline in this analysis.

Table 2

Total civilian labor force and retail/wholesale sector in Great Plains, 1950-90

Over time, there appears to be a small concentration of counties with large increases in retail/wholesale labor force

Item	Total Nonmetro N=438	Adjacent N=87	Urban non-adjacent N=138	Completely rural non-adjacent N=213
		Percent		
Change in civilian labor force (region):				
1950-60	-1.7	-2.4	5.5	-12.9
1960-70	-3.9	-5.7	1.8	-13.6
1970-80	19.0	21.4	22.0	9.1
1980-90	-2.2	-1.1	-.2	-8.9
1950-90	9.9	10.5	30.7	-25.2
Change in civilian labor force (county):				
1950-60	-4.4	-1.9	4.9	-11.4
1960-70	-7.5	-8.1	.9	-12.7
1970-80	15.7	21.2	20.9	10.2
1980-90	-6.1	-3.3	-2.8	-9.3
1950-90	.2	9.1	29.4	-22.4
Change in retail/wholesale labor force (region):*				
1950-60	9.3(37)	6.9(38)	12.9(26)	3.5(44)
1960-70	9.3(41)	6.5(44)	13.6(28)	1.5(48)
1970-80	14.5(47)	6.7(53)	24.1(20)	-4.2(62)
1980-90	-1.3(56)	6.8(45)	-3.9(63)	-2.8(56)
1950-90	35.0(40)	9.7(37)	53.1(22)	-2.3(53)
Change in retail/wholesale labor force (county):				
1950-60	11.1	13.4	16.3	6.8
1960-70	7.7	4.6	12.8	5.7
1970-80	2.9	-1.1	18.3	-5.6
1980-90	8.3	14.7	-4.1	10.6
1950-90	27.0	32.0	49.1	8.2

* Numbers in parentheses are the percentage of counties with a decade of retail/wholesale employment loss.
Source: Bureau of the Census, County and City Data Book, merged files, 1947-94.

To summarize, we found that (1) nonmetro counties of the Great Plains lost 13.6 percent in population over the four decades; (2) adjacent and completely rural counties declined in population over the four decades while urban nonadjacent counties increased; and (3) 84 percent of counties and all county types lost population during the most recent period, 1980-90. Furthermore, the civilian labor force declined during every decade except the 1970's, when there was a substantial increase. Retail/wholesale employment at the county level increased, but a small number of counties accounted for much of the increase. Population decline, civilian labor force decline, and retail/wholesale employment growth was the pattern for the 1950's, 1960's, and 1980's, while the 1970's pattern was one of population growth, labor force growth, and retail/wholesale employment growth. The relationship between population change and change in retail/wholesale employment is positive and highly significant for every time period and county adjacency type. For most counties in the nonmetro Great Plains, as population declines, retail/wholesale employment declines.

Expansion of Discount Stores and Large Employers Help Explain Changing Pattern of the 1980's

Other factors besides population change have affected retail/wholesale employment. One such factor is the so-called "Wal-Mart effect." Counties with major discount stores, such as Wal-Mart, can increase retail/wholesale employment at the expense of surrounding counties where small retail establishments can no longer compete.

In addition, counties that attract large employer industries, such as beef packing plants, or services, such as prisons, can also increase retail/wholesale employment because of the multiplier effects (employment in various other services). Thus, large increases in retail/wholesale employment are concentrated in relatively few counties.

Several related factors may have contributed to the 1980's decline in retail/wholesale sector employment. Although national discount retail stores started to expand into rural areas in the 1970's, their impact may not have been felt until the 1980's when there was a regional decline in the percentage employed in this sector. This lag could be due to "main street" retailers "holding on" until retirement with no one to take over their businesses. Even though they could not compete with national discount stores, main street retailers continued with reduced earnings until retirement. Other main street retailers carried on as long as they could, until the national discount stores put them out of business, which could have been over a period of 5 or 10 years. During the 1980's, this appears to have happened in the adjacent counties and completely rural nonadjacent counties. For example, in the completely rural nonmetro counties during 1980-90, the mean increase was 10.6 percent and the median county change was -5.0 percent. Few counties with large increases produced such a large overall mean value, but since most counties declined, the median value, or the midpoint of all counties taken together resulted in a 5.0-percent decline.

Urban nonadjacent counties went through an interesting change. Overall they gained population from 1950 to 1990 but lost population during the 1980's. Urban nonadjacent counties also had the largest declines in retail/wholesale employment during the 1980's. Until 1980, the town or small city in these counties was large enough to develop a reasonably large economic hinterland or catchment area and far enough from metro areas to maintain its retail/wholesale viability. It seems that this pattern started to change in the 1980's, perhaps due to the influx of large Wal-Mart-style retail establishments.

Furthermore, during the 1980's, relatively few adjacent and completely rural nonadjacent counties had large increases in retail/wholesale labor force (lower panel of table 2). Although different patterns emerged in the 1980's, continued monitoring will tell if these patterns will become permanent.

Developments in the 1990's Look Promising for Some Counties

Overall in the nonmetro Great Plains, the civilian labor force increased 6.6 percent, and the retail/wholesale labor force increased 7.9 percent between 1990 and 1995 (table 3). This reverses the 1980's decline for the civilian and retail/wholesale labor force in the nonmetro Great Plains. But this trend is most likely reflected in only a small number of counties, as we found for the 1970's and 1980's.

In addition, preliminary indications show that population is increasing during 1990-96. This may be yet another turnaround. After a 4.7-percent decline during the 1980's, population rose 1.5 percent during 1990-96. However, we believe this increase is concentrated in a small number of counties, as the number of natural decrease counties in the region increased and only about 187 of the 438 counties increased in population (Johnson).

This could be happening because a stronger economy is reducing the rate of outmigration, or because decades of outmigration and natural decrease are reducing the population at risk of outmigrating. Whatever the reasons, natural decrease and outmigration are still prevalent in the nonmetro Great Plains. A new pattern of population, civilian labor force, and retail/wholesale labor force increases may be emerging in the 1990's, but observers should not be too optimistic. The 1.5-percent population increase between 1990 and 1996 may only represent a small number of counties with large population increases. For perhaps the vast majority of nonmetro Great Plains counties, the 1980's pattern prevails. Further analysis of these apparent patterns, when new data become avaliable, along with more detailed disaggregation of counties and their populations, will give us a more thorough picture of the 1990's.

The consequences of population decline and retail/wholesale consolidation are very clear for the retail/wholesale employment sector in the nonmetro Great Plains. Both are major determining factors for decline in the

Table 3

Total labor force and retail/wholesale labor force in the 1990's for the nonmetro Great Plains

Both labor force variables record growth after declines in the 1980's

Years	Change in civilian labor force	Change in retail/wholesale labor force
	Percent	
1990-91	10.8	1.1
1991-92	.5	2.1
1992-93	2.2	.8
1993-94	1.0	2.2
1994-95	1.9	1.5
1990-95	6.6	7.9

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Data and Definitions

Data came from the 1950, 1960, 1970, 1980, and 1990 Censuses of Population, and from County and City Data Books from 1947 to 1994. The county is the basic unit of analysis.

Counties were grouped into four types in order to differentiate patterns as follows: total nonmetro counties; adjacent nonmetro counties (bordering a metro county); urban nonadjacent counties (an urban population of 2,500 or greater and not bordering a metro county); and, completely rural nonadjacent counties (no urban population of 2,500 or greater and not bordering a metro county).

retail/wholesale employment sector and indicators for community viability.

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Rick Reeder, Faqir Bagi, and Samuel Calhoun

Which Federal Programs Are Most Important for the Great Plains?

The Great Plains receives more Federal funds, per capita, than the country as a whole. Most of its funding is in the form of direct payments to individuals, such as retirement and disability, and in salaries, wages, and procurement. But, compared with the Nation as a whole, the region gets relatively more funding from other types of assistance, such as agricultural and natural resource payments, defense and space, and community resource programs. Program changes would affect some places more than others, depending on local demographic and economic characteristics. For example, defense procurement increases would likely benefit the region's metro areas more than nonmetro areas; welfare reform is likely to affect persistent-poverty counties more than other counties.

In this article, we use 1995 data from the Bureau of the Census to examine the Federal programs that benefit the Great Plains. By comparing the Great Plains with the Nation as a whole, we show the types of Federal programs that are most important to the Great Plains, and to different types of counties within the Great Plains. We then discuss some proposed and recently implemented program changes with significant implications for the region.

Great Plains Counties Receive Relatively Large Share of Federal Funds Per Capita

A rough gauge of the importance of Federal programs locally can be obtained by computing total Federal funds received in a particular county divided by the county population (Federal funds per capita). Our Federal funds data from the Bureau of the Census were for fiscal year 1995 and included both expenditures and loans from 1,214 programs. Because the funding data were not deemed accurate at the county level for all of the programs, we focused on 750 Federal programs that accounted for 88 percent of the total reported Federal funds. Notwithstanding the excluded funds and other data limitations (see "Data and Definitions," p. 57), we believe this analysis provides a reasonable basis for assessing the importance of Federal funds for the region.

Rick Reeder is a senior economist, Faqir Bagi an economist, and Samuel Calhoun a mathematician in the Rural Business and Development Policy Branch, Food and Rural Economics Division, ERS, USDA.

Per capita Federal funds were 10 percent higher in the Great Plains ($5,447) than in the Nation as a whole ($4,973) (fig. 1). The difference from the national average was greater for nonmetro Great Plains counties (19 percent higher than for all nonmetro counties) than for metro counties (8 percent higher than for all metro counties). This is largely explained by the relatively high level of Federal funds received by nonmetro farming-dependent counties, $6,196 per capita. Over half (277) of the 477 Great Plains counties were farming-dependent (see "Data and Definitions"). Other nonmetro Great Plains counties receiving relatively high levels of Federal funds include the 26 government-dependent counties ($6,462) and the 62 persistent poverty counties ($5,886).

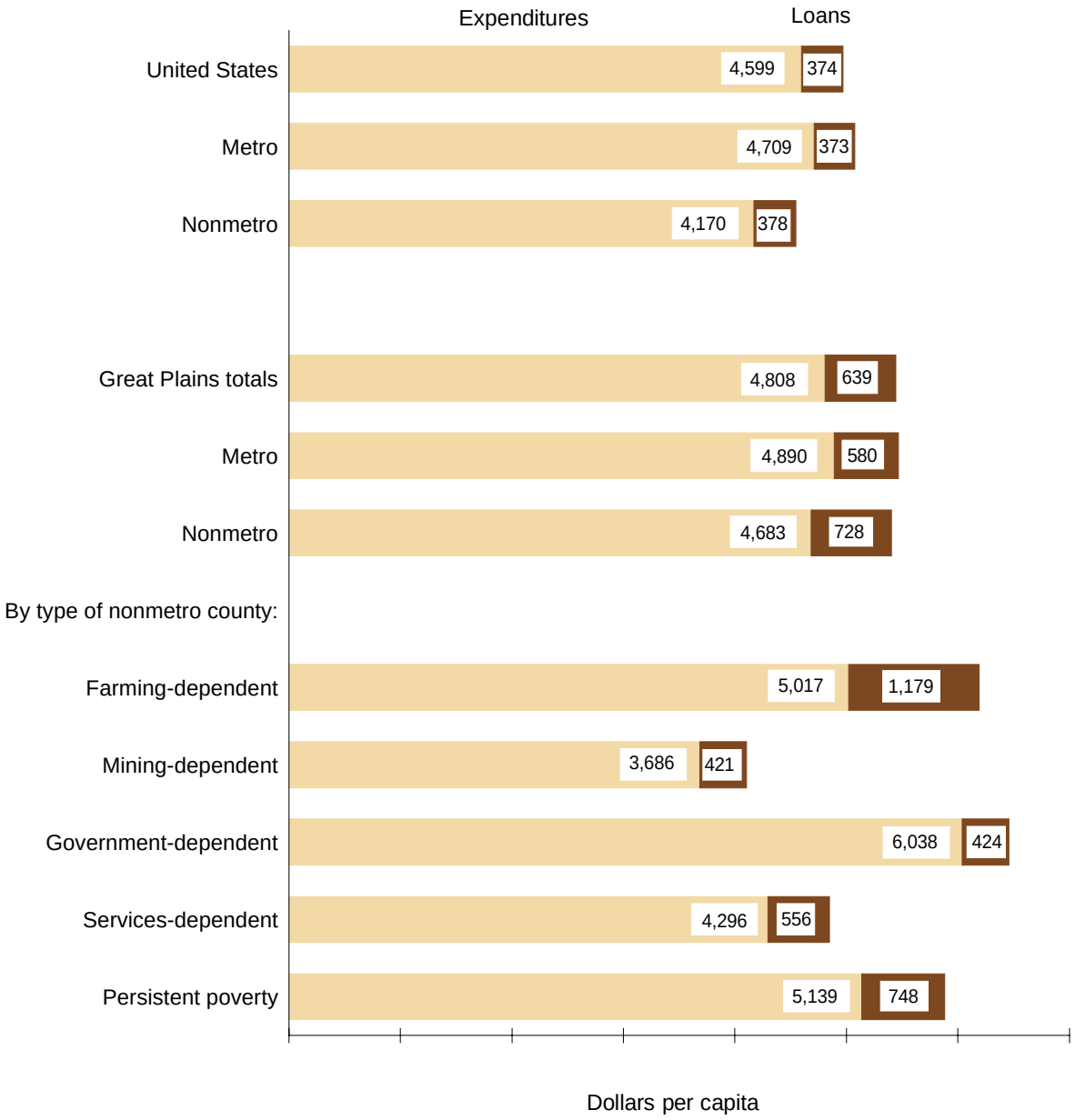
Not all nonmetro places in the Great Plains received such high levels of Federal funds. The 32 mining-dependent counties in the region, for example, received only $4,107 per capita—below the total nonmetro average, and the 48 services-dependent counties received $4,852, somewhat above the nonmetro average.

The geographic pattern of per capita Federal funding in U.S. nonmetro areas is shown in figure 2, with the Great Plains region outlined. The relatively few nonmetro counties in the region that received low amounts of Federal funds tend to be located near or adjacent to metro counties (shown as grey), specialize in mining (such as in Wyoming, Montana, and the southwest Texas / New

Figure 1

Per capita Federal funds by major type, fiscal year 1995

Funding in Great Plains exceeded national average in per capita dollars and varied greatly by type of nonmetro county



Source: Calculated by ERS using Federal Funds data from the Bureau of the Census.

Mexico border area), have little farming (several counties in Kansas and Oklahoma), or are primarily involved in cattle operations (North Central Nebraska).

Federal Fund Importance Varies by Type of Payment

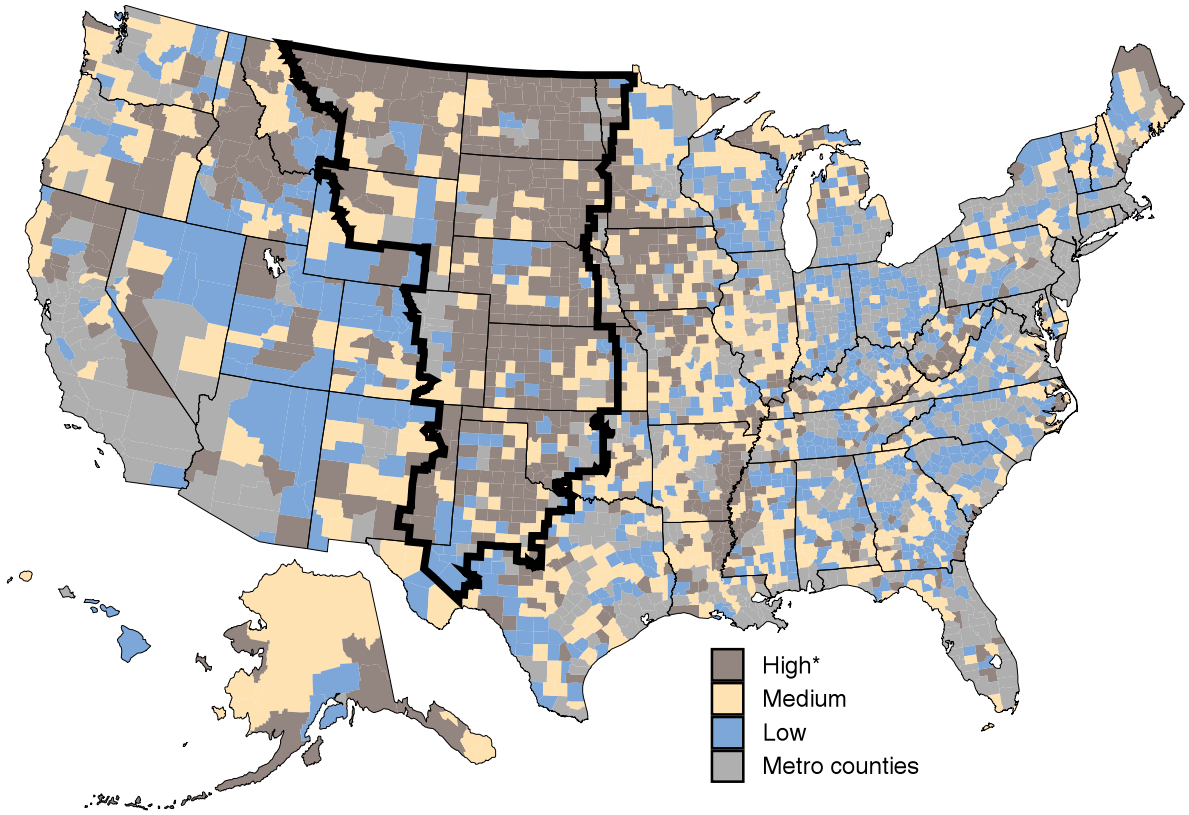
Additional insights can be gained by looking at the percentage shares of Federal funding for different types of payments, including salaries and wages, procurement contracts, direct payments (to individuals and others), grants, direct loans, and guaranteed/insured loans (table 1).

Both in the Great Plains and in the Nation as a whole, retirement and disability payments (including Social Security) accounted for about one-third of all Federal payments in 1995 (32 percent in the Great Plains, 34 percent in the Nation). The importance of these direct payments to

Figure 2

Per capita Federal funds, fiscal year 1995

Funding levels in most nonmetro Great Plains counties were relatively high



*High, Medium, and Low correspond to the top third, middle third, and bottom third of nonmetro counties nationwide. High was $4,855 or more and Low was $3,802 or less.

Source: Calculated by ERS using Federal Funds data from the Bureau of the Census.

individuals is generally greater in nonmetro areas than in metro areas, due to the higher percentages of elderly and disabled among the nonmetro population. Although these programs comprise a smaller percentage of Federal funds in the nonmetro Great Plains than in other nonmetro areas, they are an important source of local income and wealth and help sustain the demand for local goods and services.

Salaries and wages and procurement contracts together account for over one-fourth (27 percent) of Federal funds nationwide, and about the same for the Great Plains, but they are more important for metro areas than nonmetro areas. The metro Great Plains, where most of the region's urban and administrative services are concentrated, particularly benefits from these Federal payments. Salaries and wages account for 20 percent, and procurement 17 percent, of metro Great Plains Federal funds. Unlike direct payments to individuals, this kind of payment is associated with economic activity that directly creates local employment and output. And unlike retirement and disability payments, these payments need not decline proportionally with declining population.

The nonmetro Great Plains stand out most in the "other direct payments" category (including farm payments), which account for 10 percent of their Federal funds, and in direct loans, which add another 7 percent to their Federal funds receipts. These payments account for only 2 and 4 percent, respectively, of payments to nonmetro areas in general. Because of their size and importance, these payments play a significant role in the economy of the nonmetro Great Plains, and indirectly, in that of the metro areas that serve the region. Metro areas in the region receive only 1 percent of their Federal funds from "other direct payments," and they receive most of their loaned funds in the form of guaranteed loans, which comprise 10 percent of their total Federal funds.

Among the Great Plains nonmetro counties, farm-dependent counties received 17 percent of their Federal payments from "other direct payments" and 12 percent from direct loans (farm and nonfarm), much higher percentages than other Great Plains counties. Nonmetro government-dependent counties, which tend to be the locations of universities, military bases, and Federal research and admin-

Table 1

Share of Federal funds by object and place, fiscal year 1995

In the Great Plains, metro areas rely more on salaries and wages and procurement contracts and guaranteed loans; nonmetro areas rely more on direct payments (to individuals and others), grants, and direct loans

Place	Total funds	Salaries and wages	Procurement contracts	Direct payments to individuals: Retirement and disability	Direct payments to individuals: Other	Other direct payments	Grants	Direct loans	Guaranteed or insured loans
				Percent					
United States	100	13	14	34	17	1	14	2	6
Metro	100	14	15	33	17	0	14	1	6
Nonmetro	100	8	7	41	18	2	14	4	4
Great Plains	100	16	12	32	14	4	11	3	8
Metro	100	20	17	30	12	1	9	1	10
Nonmetro	100	9	5	34	16	10	13	7	6
By county type:									
Farming-dependent	100	5	2	31	18	17	11	12	7
Mining-dependent	100	5	7	38	18	6	16	2	8
Government-dependent	100	29	11	26	11	2	14	2	5
Services-dependent	100	7	4	40	18	7	12	5	6
Persistent poverty	100	7	4	29	16	10	20	5	7

Note: Individual figures may not sum to total.
Source: Calculated by ERS using Federal Funds data from the Bureau of the Census.

istrative institutions, rely most on Federal salaries and wages and procurement, which together account for 40 percent of their funding. Services-dependent counties in the Great Plains, which tend to be relatively urban and residential in nature, rely more on retirement and disability payments than do other places. Persistent-poverty counties, which in the Great Plains tend to be locations of Indian reservations and are in many cases farming-dependent counties, rely most on Federal grants and "other direct payments."

Federal Fund Importance Also Varies by Function

The functional breakout provides another view of Federal funding in the region. About half of the Federal funds in the Great Plains provide income security (table 2). This includes retirement, disability, medical, public assistance, unemployment and other such assistance (see "Data and Definitions"). The Great Plains received somewhat less from this function ($2,737 per capita) than the Nation as a whole ($2,940), largely due to lower funding in the region's metro areas. The metro areas made up for this deficiency, however, through higher payments for defense and space and community resources. The latter category covers most programs involved in economic and community development, such as business assistance, community facilities, environmental protection, housing, and transportation.

The nonmetro Great Plains disproportionately benefited from agricultural and natural resource programs, averaging $1,025 per capita, over three times the $291 national average for nonmetro areas. Farming counties in the Great Plains received almost double this amount ($2,035). Because most poverty counties in the Great Plains are also farming counties, they also benefited disproportionately from this form of assistance ($1,153). Most other types of nonmetro counties in the region benefited significantly less from these programs, though still receiving more than the national nonmetro average.

The nonmetro Great Plains also received relatively high levels of other types of Federal assistance. Compared with nonmetro areas in general, they received 32 percent more in community resources, 17 percent more in defense and space, 16 percent more in human resources (elementary and secondary education, training and employment, health and social services, food), and 13 percent more in national functions (law enforcement, energy, higher education, and other miscellaneous). Only in the income security function did Great Plains nonmetro counties receive less than nonmetro counties in general, but the difference was small—only 3 percent. Income security programs still accounted for over half (55 percent) of the Federal funds they received.

Table 2

Per capita Federal funds by function and place, fiscal year 1995

The largest variations in funding, by function, were in agriculture and natural resources and in defense and space

Place	Total funds	Agriculture and natural resources	Community resources	Defense and space	Human resources	Income security	National functions
			Dollars per person				
United States	4,973	80	475	687	78	2,940	712
Metro	5,082	26	506	789	76	2,903	782
Nonmetro	4,547	291	352	291	85	3,088	439
Great Plains	5,447	460	565	850	81	2,737	755
Metro	5,470	89	628	1,184	69	2,575	925
Nonmetro	5,411	1,025	468	341	99	2,983	495
By county type:							
Farming-dependent	6,196	2,035	466	42	100	3,152	402
Mining-dependent	4,107	363	420	48	110	2,631	535
Government-dependent	6,462	339	600	1,959	129	2,690	745
Services-dependent	4,852	640	438	89	92	3,100	493
Persistent poverty	5,886	1,153	516	19	239	2,707	199

Note: Individual figures may not sum to total.

Source: Calculated by ERS using Federal Funds data from the Bureau of the Census.

Among the different types of nonmetro counties in the Great Plains, government-dependent counties received the largest amounts for three of the functions (community resources, defense and space, and national functions). Farm-dependent counties received the most from income security programs as well as from agriculture and natural resources. Persistent-poverty counties received the most from human resources, and had the second highest amounts from community resources and agriculture and natural resources programs.

Aside from agriculture and natural resources, perhaps the most striking local variations in Federal receipts occurred with defense and space programs. As noted previously, most of this money in the Great Plains went to metro areas ($7.6 billion) for this function. Almost half of this amount, $3.2 billion, was in the form of defense procurement contracts, much of which went to metro areas in Colorado.

The 26 government-dependent nonmetro counties in the region received over $1.1 billion from defense and space funds. However, 90 percent of the money went to only four counties (Geary, KS; Ward, ND; Curry, NM; and Jackson, OK), with Geary, KS, getting almost half ($0.5 billion) of the total. Defense procurement accounted for a smaller share (26 percent) of defense and space funding, as military salaries and wages were the more significant factor for these government-dependent counties.

Federal Policy Changes Could Have Important Implications for the Region

When we review these findings in light of proposed and recently enacted policy changes, they have some important implications for the Great Plains region. For example, some current defense budget proposals aim to increase defense procurement spending to develop new weapons systems, paying for these increases by closing military bases and saving on defense personnel costs. If this were to happen, it would probably benefit metro areas in the region that rely heavily on military procurement contracts, while other places—particularly, nonmetro government-dependent counties in the region—might be more likely to experience defense funding cutbacks.

Current plans to eliminate the Federal budget deficit by the year 2002 call for major reductions in projected growth of Medicare payments. If enacted, this could significantly affect the Great Plains because of its relatively large numbers of elderly Medicare beneficiaries (Frenzen, 1996). Whether metro or nonmetro areas would be affected most could depend, in part, on whether service providers or patients would be responsible for paying for unfunded cost increases. Many nonmetro patients receive services from providers in metro areas. Nonmetro areas, however, rely somewhat more on direct payments to individuals, such as Medicare payments, than do metro areas; hence nonmetro areas could be more significantly affected.

Some policymakers have proposed the formation of a commission to review ways to scale back the rising costs

Data and Definitions

The Data. The Department of Commerce, Bureau of the Census, Governments Division provided us with their Consolidated Federal Funds Reports data. These data, obtained from various Federal departments and agencies, reflect Federal obligations for expenditures and loans during fiscal year 1995 and covered 1,214 programs. Our analysis covered 750 of these programs, accounting for $1.31 trillion, or about 88 percent of the total Federal funds reported by Census.

We excluded programs for which 25 percent or more of their funding nationally went to State capitals, because such levels suggested pass-through funding that State governments redistributed to local areas. We also excluded programs that reported much or all of their funding only at the State or national level. Such funding cannot be traced to the county level. As a result, most of the large block grant programs involved with social services, employment, and training were excluded. This understates the amount of funding received, particularly for our "human resources" function.

Interpretations should be made with caution because our data are only as good as the information each agency supplies to Census. In some cases, such as with Medicaid, the data are based not on actual outlays that go to places but on estimates based on other information, and these estimates may involve substantial errors. In other cases, like procurement, expenditures may be reported only at the location of prime contractors or primary subcontractors and ignore further subcontracting that disperses the impact of expenditures. In addition, some Federal agencies make payments to entities that provide services to multicounty areas, but the payments may be reported only to the headquarters of the multicounty entity. These data limitations may lead to an overstatement or understatement of benefits to some metro and nonmetro areas. For example, defense procurement, which we found primarily benefits metro areas and government-dependent nonmetro areas, probably involves subcontracting that disperses the benefits more broadly to some other nonmetro areas.

Census population estimates for calendar year 1995 were used to compute per capita amounts.

Definitions. The object classifications reported in table 1 [salaries and wages, procurement contracts, direct payments to individuals (retirement/disability and other), other direct payments, grants, direct loans, and guaranteed/insured loans] come from the Bureau of the Census.

In table 2, we used ERS's six broad function categories for Federal programs:

- Agriculture and natural resources (agricultural assistance, agricultural research and services, forest and land management, water and recreation resources).
- Community resources (business assistance, community facilities, community and regional development, environmental protection, housing, Native American programs, and transportation).
- Defense and space (aeronautics and space, defense contracts, defense payroll and administration).
- Human resources (elementary and secondary education, food and nutrition, health services, social services, training and employment).
- Income security (medical and hospital benefits, public assistance and unemployment compensation, retirement and disability--includes Social Security).
- National functions (criminal justice and law enforcement, energy, higher education and research, all other programs excluding insurance).

For reporting by place, we used OMB's 1993 definitions of metro and nonmetro counties and ERS's revised nonmetro county typologies. Because only 11 nonmetro counties in the Great Plains were defined as manufacturing-dependent, we excluded this economic type from our analysis; we also excluded the "nonspecialized" type to simplify the presentation. Hence, some counties did not fall into any of the types we presented. One of the county types we used, persistent poverty counties, overlaps with the other types (the main overlap in the Great Plains involves farming counties). For more information on how the county types were defined, see Cook and Mizer, *The Revised ERS County Typology*, RDRR 89, USDA, ERS, December 1994.

The Great Plains region was defined following a modified version of the counties identified in Donald J. Bogue and Calvin L. Beale, *Economic Areas of the United States*, New York: Free Press of Glencoe, Inc., 1961.

of Social Security, retirement, and disability programs. The Great Plains region relies somewhat less on these programs than the Nation in general. However, these programs still account for about one-third of all the Federal funds received in the region and 40 percent for services-dependent counties. Hence, any benefit reductions would be felt in the region, as elsewhere in the country.

The proposed reauthorization of the major transportation programs, expected sometime in 1998, could also significantly affect the Great Plains region. Transportation is one of the community resources functions from which the Great Plains benefits disproportionately. Currently, the region tends to benefit from the allocation formula for highway aid, in the sense that per capita payments are relatively high and the region gets more money from Washington than it pays through gas taxes. While there may be good reasons for receiving relatively high pay-

ments per capita (such as high costs due to low population density), some proposals would alter the formula to reallocate some of the money to other regions. Such a change might have important consequences for the Great Plains.

The reauthorization of Federal farm programs, enacted in 1996, replaced the deficiency payments with fixed production flexibility contract payments, designated to be reduced annually from 1998 to 2002 (Sommer and Perry, 1996). If these reductions take place as scheduled, this change would affect the Great Plains more than other nonmetro areas because of the importance of farm payments to the local economies in the large number of farm-dependent counties in the region.

The recently enacted welfare reform legislation will probably affect the Great Plains less than most other regions because the Great Plains region has relatively less poverty and relies less on income security programs, such as welfare and food stamps, than most other regions (Cook and Dagata, 1997). However, the persistent-poverty counties in the region are expected to be affected significantly.

The Great Plains region gets a disproportionate amount of funding from loans, particularly direct loans that often carry subsidized interest rates. Recent budget cuts have caused some Federal credit programs to shift from direct loans to guaranteed loans with little or no interest subsidy. This change could result in lower benefits to the region—particularly for farm-dependent counties that rely most on direct loans.

Another policy trend involves program reorganization and consolidation by many Federal agencies to improve efficiency and save money. To the extent that total Federal salaries and wages decline as a result of these reinvention efforts, the Great Plains may be disproportionately affected, particularly in metro areas and government-dependent nonmetro areas, which receive a relatively large amount of funds from Federal salaries and wages. The places affected will also depend on the extent that field staff is centralized and moved from nonmetro to metro areas, what productivity improvements are implemented, and how much of the savings are returned to the programs.

While many of these policies and proposals might curtail Federal spending growth and therefore dampen the growth of the Great Plains economy, some compensating benefits are expected in connection with budget savings and deficit reduction, such as reduced taxes and lower interest rates. Thus, the information presented here does not allow us to speculate about what the overall net effect of these recent and proposed changes might be for the Great Plains economy.

For Further Reading . . .

Peggy J. Cook and Elizabeth M. Dagata, "Welfare Reform Legislation Poses Opportunities and Challenges for Rural America," *Rural Conditions and Trends*, Vol. 8, No. 1, June 1997, pp. 38-47.

Paul D. Frenzen, "Proposals to Slow Growth of Federal Health Spending Focus on Medicare and Medicaid," *Rural Conditions and Trends*, Vol. 7, No. 2, December 2, 1996, pp. 40-45.

Richard Reeder, Faqir Bagi, and Samuel Calhoun, "Who's Vulnerable to Federal Budget Cuts?" *Rural Development Perspectives*, Vol. 11, No. 2, February 1996, pp. 36-42.

Judith E. Sommer and Janet E. Perry, "1996 Agricultural Legislation Cuts Link Between Income Support Payments and Farm Prices," *Rural Conditions and Trends*, Vol. 7, No. 2, December 1996, pp. 56-61.

Linda M. Ghelfi

What Do Nonemployers Contribute to Retail and Service Opportunities in the Great Plains?

The vitality of local economies and the quality of life of residents partially rely on the variety and accessibility of retail trade and services. The ability of communities to support a wide range of such purchasing opportunities depends to a large extent on the size of the local population, proximity to larger markets, the income level of the population, and local consumers' tastes and preferences. Nonemployers, establishments run by owners with no employees, play a role in providing retail and service options (see "What Is a Nonemployer?"). They are especially prevalent in small communities, where small operations can fulfill demand, and in niche markets for specialized products or services, where small operations can also fulfill demand, regardless of the size of the community.

Most datasets on establishments count only those firms with employees, excluding nonemployers. By examining data on employers and nonemployers from the 1992 Censuses of Retail Trade and Services, the contribution of nonemployers becomes evident. And, for this special issue of *RDP*, their role in the rural Great Plains is of particular interest.

Service Nonemployers Concentrated in Personal and Business Services; Retail Nonemployers Concentrated in Miscellaneous Category

Nonemployers in the services industries are concentrated in personal and business services. The two industries account for about 45 percent of the service nonemployers in rural areas in both the Great Plains and elsewhere (table 1). Personal services include such businesses as laundries, drycleaners, photographic portrait studios, beauty shops and barbers, shoe repairers, funeral homes, and tax preparers. Business services include advertisers, commercial mailing services, photocopying shops, commercial art and photographic services, building cleaning and pest control, equipment rental and leasing, temporary employment agencies, computer programming and data processing firms, detective, guard, and armored car services, security system monitors, news syndicates, photofinishing labs, bondspersons, drafting services, lecture bureaus, notaries public, and commercial sign painters.

Social and other professional services (engineering, accounting, research, and management) account for an additional 25 percent of service nonemployers in the rural

What Is a Nonemployer?

Nonemployers are firms with no paid employment during 1992. Nonemployers in retail trade must have reported at least $1,000 in sales in 1992 to be counted in the census. Nonemployers in the service industries must have reported at least $1,000 in taxable receipts in 1992 to be counted in the census. Service nonemployers must also be subject to Federal income taxes. Establishments exempt from Federal income tax with no paid employees were excluded as they have been in previous service industries censuses. For more detailed information on the retail and service industries censuses' data collection techniques, see the summary reports listed in "For Further Reading," p. 68.

Linda Ghelfi is a senior economist in the Food Assitance, Poverty, and Well-Being Branch, Food and Rural Economics Division, ERS, USDA.

Table 1

Service employers and nonemployers by location and industry, 1992

Nonemployers are more likely to be in personal, business, and social services, while employers are more likely to be in health services

Location and industry	Nonemployers				Employers			
	Nonmetro		Metro		Nonmetro		Metro	
	Establishments	Distribution by industry	Establishments	Distribution by industry	Establishments	Distribution by industry	Establishments	Distribution by industry
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Great Plains:								
Total services	115,213	100.0	210,537	100.0	24,732	100.0	52,923	100.0
Hotels, camps, and other lodging	1,278	1.1	878	.4	1,671	6.8	1,204	2.3
Personal services	23,732	20.6	33,945	16.1	3,409	13.8	5,202	9.8
Business services	27,749	24.1	54,859	26.1	2,371	9.6	9,361	17.7
Auto repair, services, and parking	8,529	7.4	8,059	3.8	3,006	12.2	5,020	9.5
Miscellaneous repair services	6,081	5.3	5,568	2.6	1,597	6.5	2,188	4.1
Amusement and recreation services	7,159	6.2	15,279	7.3	1,906	7.7	2,780	5.3
Health services	5,369	4.7	15,170	7.2	5,332	21.6	12,056	22.8
Legal services	1,141	1.0	5,160	2.5	2,042	8.3	4,617	8.7
Select educational services	3,190	2.8	7,346	3.5	53	.2	530	1.0
Social services	18,731	16.3	26,109	12.4	967	3.9	1,701	3.2
Other professional services*	10,460	9.1	33,338	15.8	2,282	9.2	7,727	14.6
Other services**	1,794	1.6	4,826	2.3	96	.4	537	1.0
Other counties:								
Total services	1,069,320	100.0	5,372,986	100.0	249,691	100.0	1,498,089	100.0
Hotels, camps, and other lodging	16,709	1.6	25,398	.5	16,485	6.6	29,259	2.0
Personal services	227,970	21.3	838,172	15.6	30,974	12.4	157,516	10.5
Business services	250,729	23.4	1,416,324	26.4	26,675	10.7	268,144	17.9
Auto repair, services, and parking	79,322	7.4	186,437	3.5	26,964	10.8	136,980	9.1
Miscellaneous repair services	51,823	4.8	134,703	2.5	11,822	4.7	55,969	3.7
Amusement and recreation services	74,904	7.0	479,547	8.9	20,337	8.1	89,823	6.0
Health services	64,145	6.0	479,131	8.9	59,897	24.0	364,420	24.3
Legal services	13,192	1.2	155,630	2.9	19,606	7.9	125,472	8.4
Select educational services	30,988	2.9	184,449	3.4	998	.4	13,154	.9
Social services	116,858	10.9	396,591	7.4	10,476	4.2	45,979	3.1
Other professional services*	120,818	11.3	919,565	17.1	24,204	9.7	198,672	13.3
Other services**	21,862	2.0	157,039	2.9	1,253	.5	12,701	.8

* Engineering, accounting, research, and management services.

** Scientific consultants, authors, lecturers, radio commentators, song writers, weather forecasters, writers, and artists working on their own account, and, within nonemployers, some businesses for which there was not enough information to classify them in a particular service industry.

Source: Calculated by ERS using data from the 1992 Census of Service Industries.

Great Plains and 22 percent in rural areas elsewhere. Nonemployers in the rural Great Plains are much more concentrated in the social services than are nonemployers elsewhere. The social services include child day care services; individual and family social, counseling, welfare, and referral services; job training and vocational rehabilitation; residential care facilities for children, the aged, and persons with special needs (excluding facilities where medical care is a major element); and establishments engaged in community improvement and social change (such as community action agencies, community chests, regional planning organizations, and advocacy groups). At the national level, 88 percent of nonemployers providing social services provide child day care services. Comparable data are not available at the county level, but service providers in the rural Great Plains are probably concentrated in child day care as well.

Compared with employers, the rural nonemployers are much more concentrated in personal, business, and social services. The employers are much more likely to provide health services than the nonemployers, undoubtedly because health services are most often provided in hospitals, clinics, and long-term care facilities that employ staff.

Over half of the retail nonemployers in all areas are classified in the miscellaneous category (table 2). They run such businesses as used goods or antique stores, book, toy, jewelry, camera, luggage, or fabric stores, mail-order operations, fuel dealerships, or other specialty shops. By comparison, only 16 to 23 percent of retail employers are clas-

Table 2

Retail employers and nonemployers by location and industry, 1992

Nonemployers are concentrated in miscellaneous retail while employers are more evenly distributed across the retail subsectors, but with the highest likelihood of operating eating or drinking establishments

Location and industry	Nonemployers				Employers			
	Nonmetro		Metro		Nonmetro		Metro	
	Establishments	Distribution by industry	Establishments	Distribution by industry	Establishments	Distribution by industry	Establishments	Distribution by industry
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Great Plains:								
Total retail	24,394	100.0	29,606	100.0	31,049	100.0	38,373	100.0
Building materials/garden supplies	862	3.5	800	2.7	2,070	6.7	1,502	3.9
General merchandise	519	2.1	642	2.2	978	3.1	703	1.8
Food stores	1,387	5.7	1,520	5.1	3,715	12.0	3,329	8.7
Automotive dealers	2,441	10.0	3,276	11.1	2,470	8.0	2,517	6.6
Gas service station	832	3.4	305	1.0	3,111	10.0	2,726	7.1
Apparel/accessory	1,096	4.5	1,733	5.9	2,249	7.2	3,490	9.1
Furniture/furnishing	1,672	6.9	2,267	7.7	1,706	5.5	2,869	7.5
Eating and drinking	2,592	10.6	2,442	8.2	8,594	27.7	11,570	30.2
Drug and proprietary*	101	.4	75	.3	1,136	3.7	842	2.2
Miscellaneous**	12,892	52.8	16,546	55.9	5,020	16.2	8,825	23.0
Other counties:								
Total retail	262,988	100.0	828,512	100.0	308,448	100.0	1,148,345	100.0
Building materials/garden supplies	9,402	3.6	24,369	2.9	19,131	6.2	46,780	4.1
General merchandise	6,250	2.4	20,599	2.5	10,340	3.4	22,585	2.0
Food stores	24,234	9.2	69,920	8.4	41,217	13.4	132,307	11.5
Automotive dealers	30,104	11.4	74,512	9.0	24,914	8.1	66,472	5.8
Gas service station	6,278	2.4	6,833	.8	27,000	8.8	72,497	6.3
Apparel/accessory	12,053	4.6	60,434	7.3	22,799	7.4	116,952	10.2
Furniture/furnishing	16,571	6.3	58,485	7.1	19,176	6.2	86,322	7.5
Eating and drinking	25,571	9.7	93,666	11.3	79,044	25.6	334,400	29.1
Drug and proprietary*	617	.2	2,238	.3	10,991	3.6	35,173	3.1
Miscellaneous**	131,908	50.2	417,456	50.4	53,836	17.5	234,857	20.5

* Proprietary stores sell nonprescription medicines.

** Miscellaneous includes tobacco stands and stores; news dealers and newsstands; fuel dealers; florists; bicycle, hobby, game, gift, novelty, souvenir, and toy shops; optical goods, sporting goods, book, stationery, jewelry, camera and photgraphic supply, luggage and leather goods, sewing, needlework, and piece goods, liquor, and used goods stores; catalog and mail-order houses, automatic merchandising machine operations; and, within employers, direct selling establishments. Also included in this group are establishments engaged in sale of specialized lines of merchandise, such as artists' supplies, orthopedic and artificial limbs, rubber stamps, pets and supplies, religious goods, and monuments and tombstones.

Source: Calculated by ERS using data from the 1992 Census of Retail Trade.

sified in the miscellaneous group. Employers are more concentrated than nonemployers in eating and drinking establishments. Like the health services, those retail establishments tend to be too large to run without the help of employees.

Nonemployers Account for Large Shares of Service and Retail Establishments...

The number of nonemployers in the service industries dwarfs the number of employers. Overall, 82 percent of service establishments in the rural Great Plains are nonemployers (table 3). By industry type, nonemployers range from 36 percent of legal services firms to 98 percent of the selected educational services included in the Economic Census of Services. (Libraries, technical schools, and other specialty schools such as drama, cooking, or flight instruction are included. Elementary and secondary schools, colleges, universities, and professional schools, and junior colleges and technical institutes offering academic degrees are outside the scope of the census.) The percentages in the rural Great Plains are quite similar to those in other rural areas. The widest differences are lower percentages of lodging and legal services and a higher percentage of social services establishments run by nonemployers in the rural Great Plains.

In retail trade, nonemployers are a minority of establishments, but by a small margin (table 3). In the rural Great Plains, 44 percent of retail establishments are nonemployers. Nonemployers comprise a much larger share of miscellaneous retail—72 percent. In other industry types, nonemployers range from 8 percent of drug and propri-

Table 3

Nonemployers as shares of all service and retail establishments, 1992

Nonemployers account for four out of every five service establishments

Industry	Great Plains		Other counties	
	Nonmetro	Metro	Nonmetro	Metro
	Percent			
Total services	82.3	79.9	81.1	78.2
Hotels, camps, and other lodging	43.3	42.2	50.3	46.5
Personal services	87.4	86.7	88.0	84.2
Business services	92.1	85.4	90.4	84.1
Auto repair, services, and parking	73.9	61.6	74.6	57.6
Miscellaneous repair services	79.2	71.8	81.4	70.6
Amusement and recreation services	79.0	84.6	78.6	84.2
Health services	50.2	55.7	51.7	56.8
Legal services	35.8	52.8	40.2	55.4
Select educational services	98.4	93.3	96.9	93.3
Social services	95.1	93.9	91.8	89.6
Other professional services	82.1	81.2	83.3	82.2
Other services	94.9	90.0	94.6	92.5
Total retail	44.0	43.6	46.0	41.9
Building materials/garden supplies	29.4	34.8	33.0	34.3
General merchandise	34.7	47.7	37.7	47.7
Food stores	27.2	31.3	37.0	34.6
Automotive dealers	49.7	56.6	54.7	52.9
Gas service station	21.1	10.1	18.9	8.6
Apparel/accessory	32.8	33.2	34.6	34.1
Furniture/furnishing	49.5	44.1	46.4	40.4
Eating and drinking	23.2	17.4	24.4	21.9
Drug and proprietary	8.2	8.2	5.3	6.0
Miscellaneous retail	72.0	65.2	71.0	64.0

Note: See table 1 for definitions of other professional and other services and table 2 for definitions of proprietary and miscellaneous retail.
Source: Calculated by ERS using data from the 1992 Censuses of Service Industries and Retail Trade.

etary establishments to 50 percent of auto dealers and furniture/home furnishings establishments. Nonemployers in other rural areas account for similar shares of retail industries as do rural Great Plains nonemployers, with the exception of a 10-percentage-point difference in the share of food stores—nonemployers are 27 percent of rural Great Plains food stores compared with 37 percent of rural food stores elsewhere.

But Account for Much Smaller Shares of Service Receipts and Retail Sales

While nonemployers account for large shares of service and retail establishments, they usually operate very small businesses. The average taxable receipts of service nonemployers in the rural Great Plains amounted to $13,150 in 1992 (table 4). Those running some type of lodging averaged the highest amount, $32,885, with health and legal service businesses not too far behind. At the low end were educational service establishments, averaging $4,433, and social services, averaging $5,958. Many of these businesses may be secondary sources of income for the owners and their families, and the businesses may be less than full-time operations. For example, some day care providers in social services may provide after school care for 2 to 3 hours per school day.

Although the average receipts of nonemployers are very low compared with those of employers, the total receipts of nonemployers in the rural Great Plains account for 19 percent of all service establishments' taxable receipts (table 5). That is larger than the 16 percent of receipts they account for in other rural areas and larger than the 11 percent they account for in urban areas of the Great Plains.

Nonemployers in retail trade average higher sales than the service providers average in receipts. In the rural Great Plains, nonemployers average $40,510 in retail sales (table 6). Gas service stations, at $131,863, have the highest average sales, followed by automotive dealers at $90,561. A middle group of nonemployer retailers—building materials and garden supplies, food stores, and furniture and home furnishings—average sales in the $41,000 to $51,000 range. The remaining retailers, including the miscellaneous group that includes half of the non-

Table 4

Average taxable receipts of service employers and nonemployers, 1992

Nonemployers run much smaller businesses as indicated by their low taxable receipts compared with employers' receipts

Location and service industry	Nonemployers		Employers	
	Nonmetro	Metro	Nonmetro	Metro
	Dollars			
Great Plains:				
Total services	13,150	17,754	269,121	554,366
Hotels, camps, and other lodging	32,885	43,923	389,645	1,062,688
Personal services	10,192	13,142	135,095	230,284
Business services	12,110	16,464	258,512	724,005
Auto repair, services, and parking	25,039	28,746	210,593	391,801
Miscellaneous repair services	18,235	21,461	254,181	391,663
Amusement and recreation services	11,902	12,794	223,531	535,055
Health services	30,708	38,985	461,373	668,736
Legal services	26,726	36,343	204,571	497,041
Select educational services	4,433	7,682	NA	583,924
Social services	5,958	8,127	97,077	220,484
Other professional services	10,788	18,153	262,668	602,417
Other services	21,068	31,526	111,500	467,975
Other counties:				
Total services	15,329	22,499	356,485	719,304
Hotels, camps, and other lodging	32,263	48,131	589,607	1,788,813
Personal services	11,103	15,628	156,373	233,003
Business services	13,567	21,103	367,898	963,241
Auto repair, services, and parking	26,006	32,034	242,566	443,837
Miscellaneous repair services	19,425	24,274	272,468	476,880
Amusement and recreation services	13,939	19,413	301,464	941,020
Health services	32,405	41,234	538,490	703,255
Legal services	32,089	43,091	250,788	748,389
Select educational services	6,220	9,090	247,354	523,740
Social services	6,531	9,509	144,612	254,691
Other professional services	14,566	22,103	305,131	890,512
Other services	26,404	37,824	269,922	597,399

NA = Too few firms in this industry; receipts not reported.

Note: Average receipts are based on establishments with taxable receipts reported. For confidentiality reasons, receipts were not reported by the census for establishments in a few counties that had very few establishments in these industries.

Source: Calculated by ERS using data from the 1992 Census of Service Industries.

employers, average much lower sales, in the $20,000 to $26,000 range.

The average sales of employers in retail trade are much higher than those of nonemployers. Of total retail sales in the rural Great Plains, nonemployers account for only 4 percent (table 7). Within the miscellaneous group, however, nonemployers account for 28 percent of retail sales. That is much higher than the 20 percent they account for in other rural areas and much higher than the 10 percent of sales they account for in urban areas of the Great Plains. The miscellaneous group contains an eclectic group of businesses. At the national level, 28 percent of the miscellaneous nonemployer retailers are in a subset including tobacco stores, newsstands, and specialized lines of merchandise such as artists' supplies, orthopedic and artificial limbs, rubber stamps, pets, religious goods, and monuments and tombstones. Another 18 percent sell used or antique merchandise, and 10 percent are catalog or mail-order merchants. The percentages of nonemployers are at least twice as high as the percentages of employers in those three groups. Whether miscellaneous nonemployer retailers in the Great Plains are distributed like the national retailers is unknown, but the implication is that these particular niche markets within miscellaneous retail trade provide many retail opportunities that nonemployers can fill without paid help.

Population and Income Relate to the Geographic Distribution of Services and Retail

Closeness to larger markets, the number of local residents, and their incomes are all related to the demand for and provision of service and retail purchasing opportunities. To investigate these relationships, I calculated ratios of employers and nonemployers to every 1,000 residents and ratios of receipts and sales to every $1,000 of residents'

Table 5

Nonemployers' shares of all taxable service receipts, 1992

Nonemployers in services industries in the rural Great Plains account for 19 percent of receipts

Service industry	Great Plains		Other counties	
	Nonmetro	Metro	Nonmetro	Metro
	Percent			
Total services	18.6	11.3	15.6	10.1
Hotels, camps, and other lodging	4.8	3.3	5.5	2.7
Personal services	36.2	27.5	35.0	26.5
Business services	38.1	11.9	26.8	10.5
Auto repair, services, and parking	26.3	10.5	24.5	9.1
Miscellaneous repair services	24.8	12.5	27.2	11.3
Amusement and recreation services	18.8	11.7	15.6	10.1
Health services	5.8	6.7	6.0	7.2
Legal services	4.9	7.4	7.1	6.7
Select educational services	100.0*	17.9	72.7	23.2
Social services	80.6	40.3	44.4	26.9
Other professional services	17.6	11.6	20.3	10.5
Other services	97.6	44.3	89.3	51.9

*No receipts reported for employer establishments in Great Plains nonmetro areas.

Note: Based on establishments with reported receipts. Receipts were suppressed by the censuses in a few counties with very few establishments in the specific type of industry.

Source: Calculated by ERS using data from the 1992 Census of Service Industries.

income for groups of counties based on adjacency to metro areas and size of own largest city.

In the service industries, the ratios of employers and nonemployers to population are highest in urban areas in both the Great Plains and elsewhere (fig. 1). Among nonmetro county types, nonadjacent counties with their own cities of at least 10,000 residents have the largest number of employers relative to population. Nonemployers are much more evenly distributed relative to population. In the Great Plains, all the nonmetro county types have 27 to 29 nonemployers per 1,000 residents. There are somewhat fewer nonemployers relative to population in nonmetro areas outside the Great Plains, ranging from 22 to 24 per 1,000 residents.

The ratio of taxable receipts per $1,000 of personal income has a very similar relationship with county type. The ratios of employers' and nonemployers' taxable receipts to income are highest in urban areas in both the Great Plains and elsewhere. The nonmetro counties that are adjacent to the urban areas have much lower ratios of receipts to income. Among the nonadjacent counties, the receipts of nonmetro service employers are highest relative to income in the counties with cities, falling off rapidly as urbanization declines to counties with towns and to totally rural counties. The receipts of nonemployers vary little by level of urbanization, averaging $21 to $24 per $1,000 of residents' income in all types of nonmetro counties.

The distribution of retail trade establishments relative to population is quite different from the services distribution, especially in the Great Plains. Overall, there are fewer retail employers and nonemployers relative to population in urban areas than in rural areas (fig. 2). In the Great Plains, the more rural the county, the larger the ratios of retail establishments to population tend to be. Outside the Great Plains, nonemployer ratios follow that trend, but ratios of employers to population decline with increasing rurality.

The ratios of retail sales to income also differ from those of services. Employers' retail sales relative to income are highest in nonadjacent nonmetro counties with cities, both in the Great Plains and elsewhere. In the Great Plains, urban employers' sales are almost as high as that ($422 compared with $454), but elsewhere, urban employers' sales are much lower relative to income. The ratio of employers' retail sales to income declines as urbanization declines. Conversely, nonemployers' sales are highest relative to income in the nonadjacent totally rural counties. They decline with increasing urbanization. The counties that are adjacent to metro areas don't follow the trends that the nonadjacent counties do. The adjacent group is a mix of counties with and without their own cities and some counties are associated with small metro areas while others are associated with large metro areas. That diversity may explain part of their mixed results. There are too few adjacent counties in the Great Plains to make a more detailed comparison of the various types of adjacent counties to their counterparts in other areas.

Table 6

Average sales of retail employers and nonemployers, 1992

Like service receipts, retail sales by nonemployers average much lower than employers' sales

Retail industry	Nonemployers		Employers	
	Nonmetro	Metro	Nonmetro	Metro
	Dollars			
Great Plains:				
Total retail	40,510	42,227	771,471	1,328,341
Building materials/garden supplies	49,509	54,992	660,415	1,704,673
General merchandise	24,081	25,791	4,495,867	11,063,042
Food stores	51,311	51,900	1,435,724	2,715,350
Automotive dealers	90,561	111,978	2,198,172	4,771,345
Gas service station	131,863	150,927	863,291	1,286,633
Apparel/accessory	25,980	25,823	421,969	614,307
Furniture/furnishing	41,185	43,859	452,558	906,134
Eating and drinking	29,942	36,969	261,684	464,998
Drug and proprietary	20,500	NA	821,474	1,438,077
Miscellaneous retail	26,100	27,984	280,746	578,831
Other counties:				
Total retail	46,380	48,126	927,864	1,335,640
Building materials/garden supplies	57,464	57,400	1,031,242	1,616,842
General merchandise	43,878	42,020	3,348,113	9,051,167
Food stores	81,147	83,373	1,639,674	2,165,883
Automotive dealers	103,089	108,792	2,331,467	4,821,315
Gas service station	138,506	192,883	1,005,723	1,400,321
Apparel/accessory	31,991	34,239	471,352	755,802
Furniture/furnishing	44,466	48,860	489,523	935,692
Eating and drinking	32,707	41,192	334,388	481,727
Drug and proprietary	32,471	119,537	1,112,456	1,801,796
Miscellaneous retail	26,721	32,515	389,305	679,694

NA = No businesses with reported sales.

Note: Average sales are based on establishments with sales reported. For confidentiality reasons, sales of retailers in a few counties with few establishments in an industry were suppressed by the census.

Source: Calculated by ERS using data from the 1992 Census of Retail Trade.

Table 7

Nonemployers' shares of all retail sales, 1992

Nonemployers in retail trade account for only 4 percent of sales; miscellaneous trade is the only retail industry where nonemployers account for a large share of sales

Retail industry	Great Plains		Other counties	
	Nonmetro	Metro	Nonmetro	Metro
	Percent			
Total retail	4.0	2.4	4.1	2.5
Building materials/garden supplies	1.4	1.4	2.0	1.7
General merchandise	.2	.1	.5	.3
Food stores	.8	0.9	2.7	2.0
Automotive dealers	3.7	3.1	5.1	2.5
Gas service station	2.0	1.1	2.2	1.0
Apparel/accessory	1.8	1.9	2.8	2.2
Furniture/furnishing	7.2	3.7	6.8	3.4
Eating and drinking	2.9	1.6	3.0	2.3
Drug and proprietary	0*	0*	0*	.2
Miscellaneous retail	27.8	10.3	20.4	9.0

*Less than 0.05 percent.

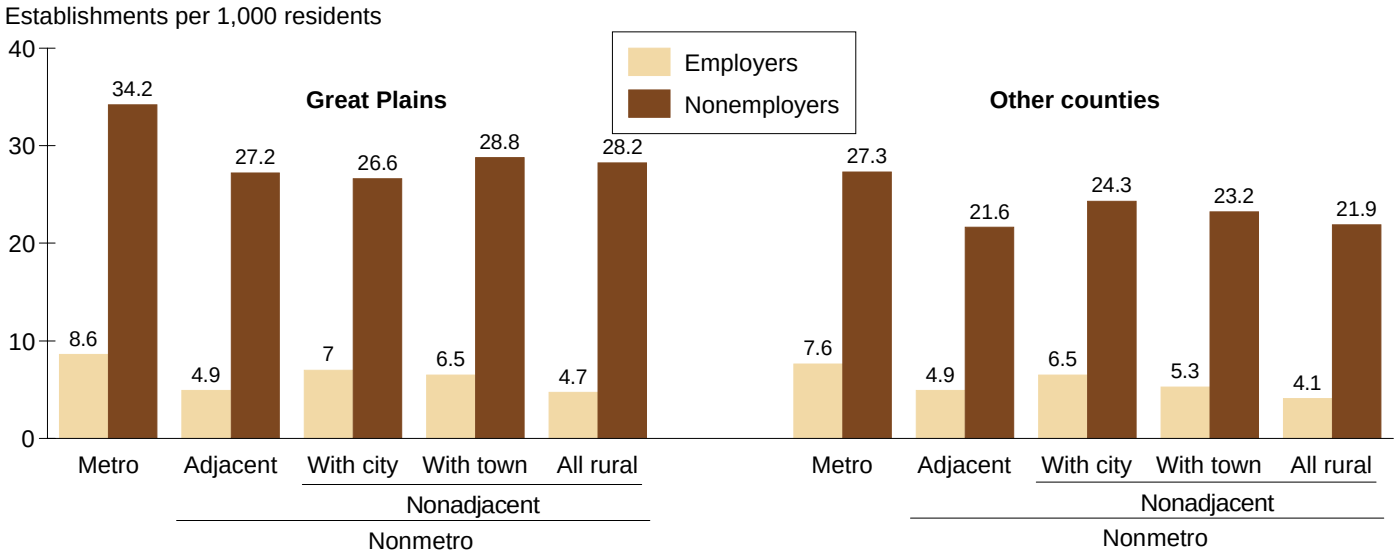
Note: Based on establishments with reported sales. Sales were suppressed by the censuses in a few counties with very few establishments in the specific type of industry.

Source: Calculated by ERS using data from the 1992 Census of Retail Trade.

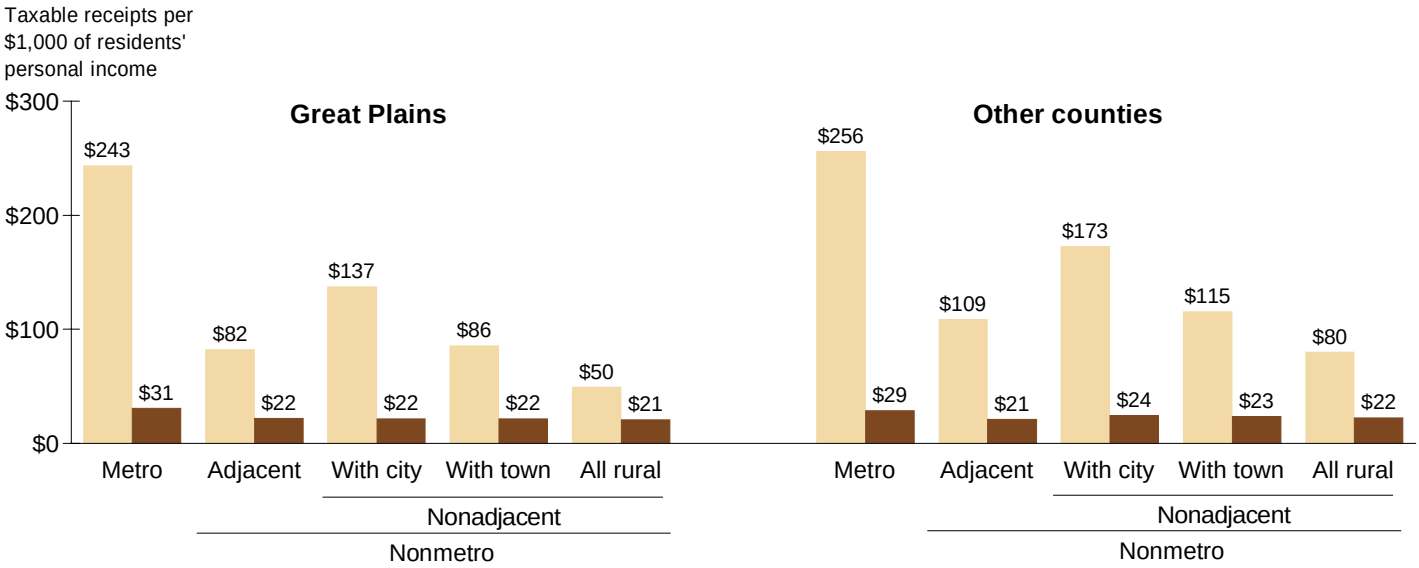
Figure 1

Service establishments per 1,000 residents and taxable receipts per $1,000 of residents' personal income, 1992

Great Plains counties at all urbanization levels average as many or more service establishments relative to population as their counterparts in other areas of the country do...



...taxable receipts of employers relative to income rise with increasing urbanization; nonemployers' receipts average about $22 per $1,000 of residents' income at all levels of nonmetro areas' urbanization



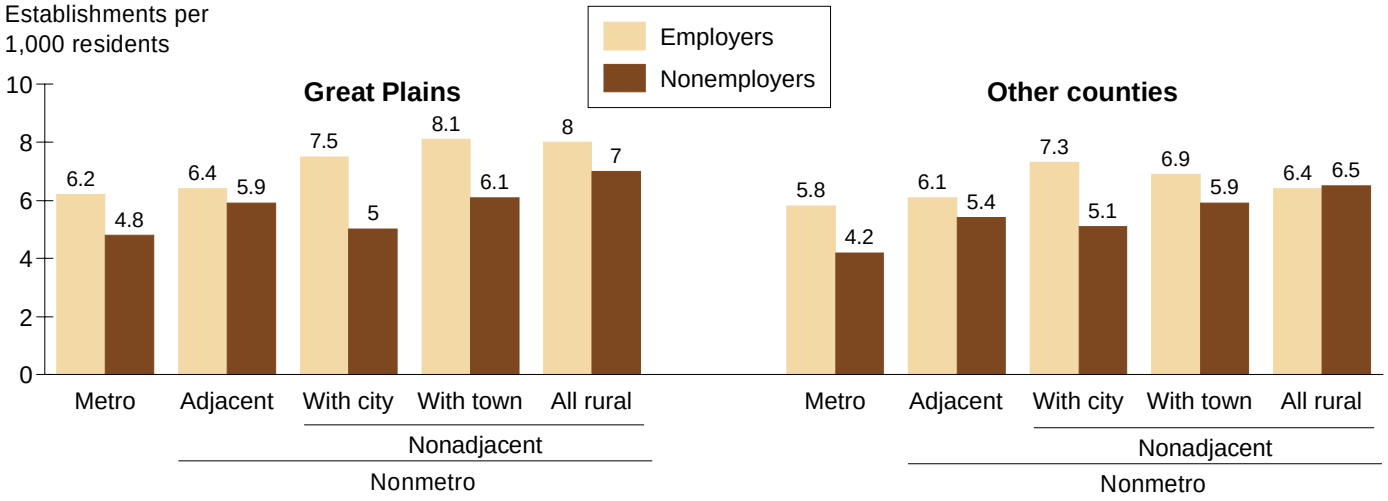
Source: Calculated by ERS using establishment and receipts data from the 1992 Census of Service Industries, 1992 population from the Bureau of the Census, and 1992 personal income from the Bureau of Economic Analysis.

The patterns of establishment and sales distributions within the services and retail trade sectors are generally consistent with patterns of establishment size and shopping patterns. The urban areas and nonadjacent counties with cities dominate services. They are trade centers, containing a broader set of services and more specialized services. Residents of outlying areas purchase specialized services in the trade centers, accounting for some of the difference in receipts between areas. The urban areas have fewer retail establishments relative to population, but their retailers have much higher average sales, suggesting that they tend to be larger establishments serving more customers. Retail sales are much higher relative to income than are services receipts. While shopping for more specialized items is probably concentrated in trade centers (Gale, Henderson and Hines), many retail items are staples that consumers buy in enough quantity and frequency that they are sold in even the smallest markets.

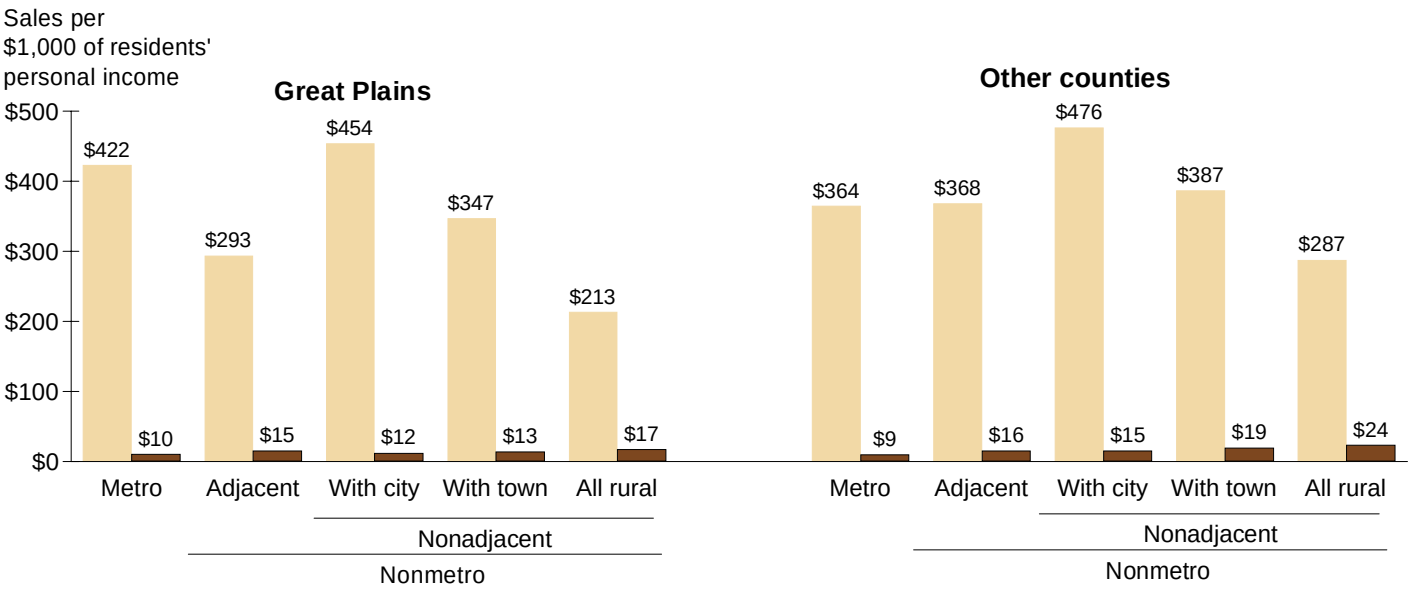
Figure 2

Retail establishments per 1,000 residents and sales per $1,000 of residents' personal income, 1992

There are more retailers, both employers and nonemployers, relative to population in all types of nometro areas than in metro areas...



...in both the Great Plains and elsewhere, retail employers average the highest sales relative to local income in nonmetro nonadjacent counties with cities; conversely, retail nonemployers average slightly higher sales relative to income in the most rural nonadjacent counties



Source: Calculated by ERS using establishment and sales data from the 1992 Census of Retail Trade, 1992 population from the Bureau of the Census, and 1992 personal income from the Bureau of Economic Analysis.

Food is the most prominent example of staples, with clothing and gasoline being other significant examples.

Pool of Ready Entrepreneurship

Researchers debate about the share of new jobs created by small versus large employers. Nonemployers do not figure in that debate because most datasets exclude them and they are not creating jobs for others. Home-based and microbusinesses, however, are fostered by many organizations concerned with local development. For example, the Aspen Institute runs a Self-Employment Learning Project. The University of Colorado at Denver, with support from U S West Foundation, has developed the NxLevel program to train rural entrepreneurs to start small businesses or write business plans for businesses they already run. And, the National Endowment for the Arts and the U.S. Forest Service run a small grants program to help artisans in forestry-dependent rural communities improve their business and marketing

skills and become commercially successful. The breadth of the microenterprise development field is reflected in the 1996 Directory of U.S. Microenterprise Programs, which contains information on 328 programs offering lending, technical assistance, and/or training to aspiring entrepreneurs.

This analysis has shown that nonemployers provide service and retail shopping opportunities, especially in small niches of the economy. They may represent a pool of entrepreneurial skills that could lead to larger businesses employing workers. As rural communities, especially remote Great Plains communities, look for ways to expand and diversify their economies, the business acumen of local nonemployers is one resource to tap.

For Further Reading . . .

Aspen Institute, Self-Employment Learning Project, 1996 *Directory of U.S. Microenterprise Programs, 1997*. Information on this and other microbusiness publications is available on the Aspen Institute's internet homepage at http://www.aspeninst.org/dir/publications/eoppubs.html

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